2/15/80

S 7560-1.1

An Economic Report to the Governor of the State of Tennessee

On the State's Economic Outlook

Volume 1

1796

January 1980

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No.
TN-STAE-80

2. Government Accession No.

3. Recipient's Catalog No.

4. Title and Subtitle
ECONOMIC REPORT TO THE GOVERNOR OF THE STATE OF TENNESSEE
ON THE STATE'S ECONOMIC OUTLOOK Volume 1

5. Report Date
January 1980

6. Performing Organization Code

7. Author(s)
Center for Business and Economic Research

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Tennessee State Planning Office
660 Capitol Hill Building
Nashville, TN 37219

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Agency Name and Address
Economic Development Administration
U.S. Department of Commerce
Washington, D. C. 20230

13. Type of Report & Period Covered
Final

14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstracts

A forecast of the economic conditions within the State of Tennessee is presented. It focuses on the way in which national economic health and national and international policy are likely to influence the State. Material is presented to compare the short-run forecast to recent periods of national recession. The long-run forecast provides data for the years 1980 through 1988.

17. Key Words
National and State Economic Conditions
Forecast of the years 1980 through 1988

18. Distribution Statement

19. Security Classif. (of this report)
UNCLASSIFIED

20. Security Classif. (of this page)
UNCLASSIFIED

21. No. of Pages

22. Price

AN ECONOMIC REPORT TO THE GOVERNOR OF THE STATE OF TENNESSEE

On the State's Economic Outlook

Volume 1

Prepared by

CENTER FOR BUSINESS AND ECONOMIC RESEARCH
COLLEGE OF BUSINESS ADMINISTRATION
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Editors:

Stephen P. Coelen, Project Director and Director, Tennessee Econometric Model
William F. Fox, Associate Director, Tennessee Econometric Model
Glen E. Schuler, Jr., Associate Director, Tennessee Econometric Model

In Cooperation With

THE TENNESSEE STATE PLANNING OFFICE

Published By

The Tennessee State Planning Office
Nashville, Tennessee

January 1980

The preparation of this report was financed in part through the Tennessee State Planning Office and EDA Planning Grant 04–25–01355–02.

CONTRIBUTORS TO THE REPORT

AUTHORS

OVERVIEW

Stephen P. Coelen, Associate Professor of Economics

MANUFACTURING

Charles B. Garrison, Professor of Economics

ENERGY

John R. Moore, Associate Dean and Professor, Department of Economics

Glen E. Schuler, Jr., Assistant Professor of Economics

FINANCE, INSURANCE, AND REAL ESTATE

Richard M. Duvall, Head and Professor, Department of Finance

Albert L. Auxier, Associate Professor of Finance

H. Stan Banton, Assistant Professor of Finance

TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES

Frank L. Hendrix, Professor of Transportation

TRADE AND SERVICES

James R. McMillan, Associate Professor of Marketing

AGRICULTURE

Irving Dubov, Professor of Agricultural Economics

STATE AND LOCAL GOVERNMENT

Kenneth E. Quindry, Research Professor, Center for Business and Economic Research

William F. Fox, Assistant Professor of Finance

SUPPORTING CBER STAFF

Patricia Price, Research Associate

Susan Bott, Graduate Research Assistant

Stephanie Fitzgerald, Managing Editor

Jeanne McDonald, Publications Coordinator

Susannah Prescott, Editorial Assistant

Patricia Hunley, Word Processing Group Supervisor

Denise Jones, Senior Magnetic Keyboard Specialist

Patricia Flynn, Magnetic Keyboard Specialist

Brenda Henderson, Magnetic Keyboard Specialist

Fritz Rudolph, Graphic Artist

FOREWORD

An Economic Report to the Governor of the State of Tennessee for 1980 is presented in two volumes. Together they provide a comprehensive and unified evaluation of the most likely future economic environment for the nation and the State. Exceptional uncertainty, particularly at the national and international levels, draws attention to the assumptions which underlie these economic forecasts. These critical assumptions are stated in the Introduction contained in both Volume 1 and Volume 2.

Generally speaking, Volume 1 presents the overview forecast and summary sectoral analysis of both short-term (to 1981) and long-term (to 1988) forecasts. Special emphasis in Volume 1 is placed on brevity in review of potential consequences of the comprehensive forecast for the State of Tennessee. Volume 2 contains detailed evaluation of each of the major sectors of the economy accompanied by extensive tabular data in the text, plus complete statistical appendixes covering each year of the forecast period, to 1988, as well as statistical economic history, from 1969 to the present.

The report is the result of professional judgment of professors at The University of Tennessee, Knoxville, all authorities in specific areas of economic activity. Their forecasts were developed in interaction with the overall forecast, using the Tennessee Econometric Model.

Many other people, too numerous to mention specifically, have contributed to the contents of this report. The research staff extends special appreciation to the Director and staff of the Tennessee State Planning Office.

Stephen P. Coelen
Project Director

David A. Hake, Director
Center for Business and
Economic Research

TABLE OF CONTENTS

Volume 1

Chapter Page

Foreword v

1 Introduction 1

2 The Outlook for the Tennessee Economy 5
  Introduction 5
  Significant Features of the Tennessee Forecast 7
  The National Outlook 14
  The National Climate for Economic Growth . . . 19
  Monetary Policy 20
  U.S. and OPEC Energy Policies 26
  Fiscal Policy 29
  The 1980 State Downturn--How Serious? 30

3 The Outlook for Specific Industry Groups in the Tennessee Economy 41
  Manufacturing 41
  Energy 44
  Finance, Insurance, and Real Estate 47
  Transportation, Communications, and Public Utilities 51
  Trade and Services 54
  Agriculture 58
  State and Local Government 61

Volume 2

Foreword v

1 Introduction 1

2 Manufacturing 5
  Introduction 5
  Cyclical Responsiveness of Tennessee Manufacturing 5
  Short-Term Forecast 11
  Long-Term Forecast 16
  The Importance of Policy 24

3 Energy 25
  Sector Response in Historical Perspective . . . 25
  National Outlook 28
  Short-Term Forecast 30
  Long-Term Forecast 34
  A Short Note on Policy Perspectives 41

TABLE OF CONTENTS

Volume 2 (Continued)

Chapter Page

4 Finance, Insurance, and Real Estate 45
  Finance and Banking 45
    The Historical Record of the FIRE Sector 45
  FIRE Short-Term Forecast 48
  FIRE Long-Term Forecast 52
  FIRE Subsector: Insurance 54
    Life Insurance Short-Term Forecast 54
    Life Insurance Industry Long-Term Forecast 59
  Property and Liability Insurance Short-Term Forecast 62
      Property and Liability Long-Term Outlook 65
  FIRE Subsector: Real Estate 68
    Real Estate Short-Term Forecast 68
    Real Estate Long-Term Forecast 72

5 Transportation, Communications, and Public Utilities 75
    Introduction 75
    Sector Response to Economic Downturns 76
  Short-Term Forecast 82
  Long-Term Forecast 85
    State Policy Perspectives 89

6 Trade and Services 93
  Short-Term Analysis 93
  Trade Forecast through 1981 95
  Services Forecast through 1981 101
  Long-Term Analysis 103
  Trade Forecast through 1988 108
  Services Forecast through 1988 112

7 Agriculture 115
  Short-Term Forecast 115
    Economic Slowdown 115
    Export Demand 116
    Input Costs Higher 117
    Key Item--Energy Costs 117
    Other Inputs 119
    Short-Term Projections 120
  Long-Term Forecast 123
    Long-Term Projections 126

8 State and Local Government 129
  Short-Term Forecast 129
  Government Sector in Economic Slowdown 130
    Government Contribution to Gross State Product 137

TABLE OF CONTENTS

Volume 2 (Continued)

Chapter Page

8 Wages and Salaries 137
Public Employment 141
Long-Term Forecast 141

Appendix Tables 143
Appendix A: Tennessee Econometric Model Forecast Data (1979-1988) 145
Appendix B: Tennessee Econometric Model Historical Data (1969-1978) 167

LIST OF TABLES

Volume 1

Table Page

1 Tennessee Selected Indicators 8

Volume 2

Table Page

1 Growth of Manufacturing Employment in Tennessee and the United States 7

2 Sensitivity of Manufacturing Employment to Cyclical Fluctuations, Tennessee and the United States . . 8

3 Change in Tennessee Employment During Periods of Economic Recession and Economic Expansion: Selected Manufacturing Industries, 1973-1980 . . 17

4 Tennessee and United States Manufacturing Jobs by Industry, 1960 and 1979 23

5 Energy Comparisons: Tennessee and the United States 26

6 Tennessee Energy Prices 32

7 Tennessee Energy Consumption 33

8 Comparisons of United States and Tennessee Total Energy Consumption and Total Energy Consumption to Real Output Ratio 35

9 Tennessee Average Annual Growth Rates of Energy Prices 37

10 Comparisons of Tennessee Average Annual Energy Consumption Growth Rates by Energy Type 39

11 Actual and Estimated Purchases of Ordinary Life Insurance in Tennessee 55

12 Estimated Direct Written Tennessee P&L Insurance Premiums 67

LIST OF TABLES

Volume 2 (Continued)

Table		Page
13	Tennessee Transportation, Communications, and Public Utilities, Selected Economic Variables, 1979-1988	83
14	Recent and Short-Term Tennessee Retail Sales. . . .	96
15	Composition of Real Personal Consumption Expenditures in the United States, 1960, 1970, and 1980	102
16	Tennessee Gross State Product by Sector, 1978-1981.	104
17	Tennessee Employment by Sector, 1978-1981	105
18	Composition of Real Personal Consumption Expenditures, 1975, 1980, and 1985	109
19	Tennessee Retail Sales, 1980, 1984, and 1988 . . .	110
20	Average Annual Percent Change in Real Growth, Trade and Services Sectors	113
21	Tennessee Agriculture Sector, Selected Economic Variables, 1978-1981.	121
22	Tennessee Agriculture Sector, Selected Economic Variables, Long-Term Forecasts	127

LIST OF FIGURES

Volume 1

Figure Page

1 National Productivity 12

2 Quarterly GNP Economic Forecasts 15

3 Quarterly National Unemployment Rate Forecasts . . 16

4 Quarterly GNP Deflator Index Forecasts 17

5 Behavior of National Money Supply (M1) in Recessions 22

6 Behavior of National Prime Interest Rate in Recessions 23

7 Residential Rates for Electrical Service 28

8 Behavior of Tennessee Gross State Product in Recessions 33

9 Behavior of Tennessee Unemployment Rate in Recessions 34

10 Behavior of Tennessee Durable Goods Output in Recessions 35

11 Behavior of Tennessee Nondurable Goods Output in Recessions 36

12 Relation of Tennessee Gross State Product to U.S. Gross National Product 37

13 Relation of Tennessee Unemployment Rates to U.S. . 38

14 Relation of Tennessee Durable Goods Output to U.S. 39

15 Relation of Tennessee Nondurable Goods Output to U.S. 40

Volume 2

Figure Page

1 Tennessee Manufacturing Employment, 1960-1969 . . . 12

LIST OF FIGURES

Volume 2 (Continued)

Figure		Page
2	Tennessee Manufacturing Employment, 1969-1979 and Forecast, 1980-1981	15
3	Tennessee Durables Manufacturing Employment Changes by Industry, 1979, 1980, and 1981	18
4	Tennessee Nondurables Manufacturing Employment Changes by Industry, 1979, 1980, and 1981	19
5	Tennessee Durables Manufacturing Employment Gains by Industry Forecast: 1980 to 1988	20
6	Tennessee Nondurables Manufacturing Employment Gains by Industry Forecast: 1980 to 1988	21
7	Energy Usage by Sector in BTU's, Tennessee	29
8	Percent Changes in Current Dollar Gross State Product and Transportation, Communications, and Public Utilities Output	77
9	Average Annual Wage and Salary Percent Changes for All Sectors and Transportation, Communications, and Public Utilities	78
10	Current Dollar Gross State Product and Transportation Communications, and Public Utilities Output	79
11	Employment Percent Changes for All Sectors and Transportation, Communications, and Public Utilities	80
12	Disposable Personal Income and Sales	99
13	Growth Rates for Current Dollar State and Local Government Expenditures	132
14	State and Local Government Expenditures as a Percent of Gross State Product	133
15	Real State and Local Government Expenditures	134
16	Growth Rates for State and Local Tax Revenues	136
17	Real State and Local Government Tax Revenues	138

CHAPTER 1

INTRODUCTION

An Economic Report to the Governor of the State of Tennessee embodies the annual economic forecast of the Tennessee Econometric Model. It is a Report made this year in an environment laden with uncertainty. While national forecasts have been uniformly pessimistic, other preliminary data on the third quarter of 1979 (1979.3) are contradictory, for example, showing increases in output, profits, and sales. In the beginning of the fourth quarter, on October 6, the Board of Governors of the Federal Reserve Bank announced a new policy of monetary control that does not resemble any prior policy with which the country has had experience. Further, on December 13, several members of the Organization of Petroleum Exporting Countries (OPEC) announced a 33 percent price hike on foreign oil accounting for $6 per barrel. Indications from other OPEC nations suggest further price hikes in the near future. If any single conclusion is clear, it is that the economy is in a dramatic state of unrest.

The 1980 Economic Report contains a forecast consistent with all the above factors, except the most recent oil price increases. It sorts out the diverse national data, determining what factors directly or indirectly influence Tennessee. The direct effects generally alter prices of inputs used in the production of the State's output while indirect effects influence either the competitiveness of other national firms producing similar outputs or the level of aggregate national demand. The forecast which is presented implicitly measures changes in the economic position of the State in both the short run, 1980 and 1981, during which the nation is predicted to move into and out of a recession and the long run, through 1988.

The short-run forecast calls for a 0.01 percent decline in the real value of Tennessee output in 1980 and a 3.5 percent increase in output in the 1981 rebound. The long-run forecast presents an annual average rate of growth of 2.8 percent over the next decade. Both forecasts are presented in this and the following volume.

The organization of this year's Economic Report differs somewhat from that of previous years. The Report maintains (1) the distinction between short-and long-run forecasts, (2) the sectoral approach to specific analyses on manufacturing; energy; finance, insurance, and real estate; transportation, communications, and public utilities; trade and services; agriculture; and state and local government, and (3) the presentation of historical and forecast details. Otherwise, in order to more effectively serve the different users of the Economic Report to the Governor, the material is presented in two volumes rather than one.

Volume 1 has two major overview chapters. Chapter 2 presents the general outlook for the Tennessee and the national economies. Significant features of the economy are presented, focusing on gross state output, unemployment rates, durable and nondurable goods forecasts, and other selected policy variables. The analysis contained within the chapter focuses on the likely outcome of major economic and energy policy changes, since these are deemed most important in setting the general tone of the economy. Finally, a series of figures is presented to compare and contrast the 1979, 1980, and 1981 period with earlier national downturns of 1969 and 1970, and 1973, 1974, and 1975.

Chapter 3 contains a short description of the major trends that exist within the sectors. Emphasis is placed more on the short-run forecasts in Chapter 3 than on the long-run. Finally, where it is considered to be important, the outlines of potential future policy decisions which loom as important aspects in the economic health of specific sectors are presented.

Volume 2 contains the traditional forecasts, by industrial sector, of the Tennessee economy. These are designed to carry the most detailed industrial data which are forecast. Authors who are specifically knowledgeable of each sector present analysis of the status of these sectors in Tennessee. Each chapter is divided into a short- and a long-run focus. The general organizing theme is their comparison of the short-run forecast to historical data. Wherever relevant, a section on policy is included to foreshadow what are considered to be important future issues. Finally, in the Appendix to Volume 2 there are tables containing the detailed historical and forecast data. These cover a full twenty years of data ranging from 1969 to 1988.

CHAPTER 2

THE OUTLOOK FOR THE TENNESSEE ECONOMY

Introduction

An Economic Report to the Governor of the State of Tennessee is based on analysis and forecasts of the Tennessee Econometric Model. It provides a picture of the Tennessee economy as it was in the fourth quarter of 1979 with a forecast from that point through 1988. The Economic Report analyzes the State's economy with respect to the national economy, accepting the national and international forces that influence economic activity. This year's Report primarily analyzes the 1979, 1980, and 1981 years because these are ones for which an economic downturn is widely predicted. The Report compares the current period and short-run forecast to the downturns which occurred in the 1969-1970 and 1973-75 periods. These were the most recent years of national recession and 1979 is the expected beginning of another downturn.

The earlier recessions had very different effects in Tennessee--the 1969 recession was mild, a time of continuing growth in real State output but the 1973 recession was severe when real output in Tennessee declined on an annual basis. In the 1973 recession there was a doubling of the unemployment rate. The current forecast concludes that 1979-1980 will produce a period more like 1969 than 1973, but worse than 1969 by some margin and in some respects different from both periods. A conclusion linking the new forecast to the previous periods should be helpful to those who remember the impacts of the 1969 and 1973 downturns on their businesses and on the State.

The outlook of the Tennessee economy for 1980 is pessimistic because of the softening of the national markets in which Tennessee producers sell their output. National forecasters are now uniformly predicting a downturn in the national economy, serious enough so as to warrant labelling the downturn of their forecasts a recession. Their gloom has persisted since the second quarter of 1979, when national output declined by 2.4 percent at an annual rate. Despite the recovery in the third quarter of 1979 which has spurred output, profits and sales, the gloomy forecasts have persisted. Third quarter output increased 3.5 percent, profits increased 6.2 percent, and the retail sales of firms such as K-Mart (up 13.7 percent annually) and Sears (up 3.7 percent in November) also increased. However, the forecasters' pessimism has been consistent with other facts, such as a 4.2 percent decrease in durable goods orders in October. This index, as good a leading indicator of a long-run downturn in the economy as exists, outweighs the temporary upturn in 1979.3 (1979, third quarter). Conventional wisdom has suggested that the strong third quarter has simply delayed the eventual downturn. It has displaced the downturn one-quarter into the future without moderating or defusing it altogether. As a result, this year's Economic Report predicts a modest decline for 1980 in the real output of the State.

This is the first year since the introduction of the annual Economic Report to the Governor of the State of Tennessee that a real downturn in the economy has been predicted. Attempts to bolster the economy with falsely optimistic statements of its future will only delude individuals to invest poorly, wasting resources and profitability in already hard times. The best service the Economic Report can give is to be an accurate document which prepares the State's economy to move into and out of the pending downturn the best way possible.

Significant Features of the Tennessee Forecast

The single most indicative series depicting the health of the Tennessee economy is the change in the gross state product (GSP). Since this is an indicator of output in all sectors, care must be taken not to double count economic activity in any significant way.* It is the State equivalent of the comparable national series, the gross national product (GNP).

The forecast in the Report suggests continual growth in the current value of gross state product,** enough so that it will double by 1987. During the decade, as shown in Table 1, gross state product will rise from $43.5 billion, the preliminary estimate of output in 1979, to $99.5 billion in 1988.

The current level of inflation is sufficiently great that it is a primary factor pushing Tennessee and the nation into the anticipated downturn. The rate of inflation is the chief economic policy target upon which the Federal Reserve Bank has been focusing.

---

* This precludes, for example, measuring output simply by the sum of all sales, since intermediate goods are sold once to a producer, repackaged in some way, and then resold as part of another good. Measuring sales would count more than the value added in the production of the good.

**This is the value of the State's output, unadjusted for current inflation.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE 1: TENNESSEE SELECTED INDICATORS

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TN GROSS STATE PRODUCT (MIL. DOL.)	TGSP	43496.6	47029.4	52170.2	57595.6	63153.4	69189.9	75537.9	82698.7	90791.1	99458.8
2	PERCENTAGE CHANGE		10.74	8.12	10.93	10.40	9.65	9.56	9.17	9.48	9.79	9.59
3												
4	TN GROSS STATE PRODUCT (MIL 72 $)	TGSP*	26470.1	26467.5	27399.3	28191.6	28990.3	29837.9	30666.2	31638.7	32780.5	33955.4
5	PERCENTAGE CHANGE		1.93	-0.01	3.52	2.89	2.83	2.92	2.78	3.17	3.61	3.58
6												
7	US GROSS NATIONAL PRODUCT (BIL 72 $)	GNP*	1418.5	1428.9	1482.5	1528.4	1569.1	1610.5	1651.6	1699.7	1759.3	1816.7
8	PERCENTAGE CHANGE		1.38	0.73	3.75	3.10	2.66	2.64	2.55	2.91	3.51	3.26
9												
10	TN PERSONAL INCOME (MIL. DOL.)	TPY001	31797.8	35098.3	38933.7	42906.2	46965.2	51274.7	55903.3	61144.2	67053.8	73500.1
11	PERCENTAGE CHANGE		11.46	10.38	10.93	10.20	9.46	9.18	9.03	9.37	9.66	9.61
12												
13	TN PERSONAL INCOME (MIL 72 $)		19424.4	19740.3	20437.6	21063.4	21672.9	22293.4	22930.0	23653.5	24508.0	25441.4
14	PERCENTAGE CHANGE		2.14	1.63	3.53	3.06	2.89	2.86	2.86	3.16	3.61	3.81
15												
16	US PERSONAL INCOME (BIL 72 $)		1171.5	1188.9	1231.7	1269.4	1306.7	1344.9	1382.6	1422.0	1468.9	1518.7
17	PERCENTAGE CHANGE		2.32	1.48	3.60	3.06	2.94	2.92	2.81	2.85	3.30	3.39
18												
19	TN EMPLOYED PERSONS (THOUS)	TNICT	1870.8	1891.9	1921.1	1943.9	1966.1	1986.9	2011.8	2036.8	2065.7	2095.7
20	PERCENTAGE CHANGE		3.07	1.13	1.54	1.19	1.14	1.16	1.15	1.24	1.42	1.45
21												
22	US EMPLOYED PERSONS (THOUS)	UNTCT	96593.	97355.	99124.	100594.	102128.	103621.	105002.	106419.	107931.	109435.
23	PERCENTAGE CHANGE		2.35	0.79	1.82	1.48	1.52	1.46	1.33	1.35	1.42	1.39
24												
25	TN UNEMPLOYMENT RATE	INUNR	6.0	7.1	6.9	6.8	6.7	6.5	6.4	6.2	5.9	5.4
26												
27	US UNEMPLOYMENT RATE	UEUNR	6.0	7.4	7.3	7.2	7.0	6.8	6.6	6.3	6.0	5.5
28												
29	IMPLICIT DEFLATOR, GSP	UDGSP	164.3	177.7	190.4	204.3	217.8	231.9	246.3	261.4	277.0	293.0
30	PERCENTAGE CHANGE		8.64	8.13	7.16	7.30	6.63	6.45	6.23	6.11	5.96	5.80
31												
32	IMPLICIT DEFLATOR, GNP	UDGNP	165.7	179.7	193.3	208.0	222.1	236.7	251.8	267.8	284.4	301.4
33	PERCENTAGE CHANGE		9.01	8.45	7.57	7.60	6.78	6.57	6.38	6.35	6.20	5.98
34												
35	TN MFG OUTPUT / EMPLOYEE (THOUS 72 $)		17.9	17.9	18.5	19.1	19.6	20.1	20.5	21.0	21.6	22.2
36	PERCENTAGE CHANGE		2.21	-0.30	3.79	2.88	2.60	2.45	1.98	2.46	2.88	2.79
37												
38	US MFG OUTPUT / EMPLOYEE (THOUS 72 $)		16.9	17.2	17.8	18.3	18.8	19.3	19.9	20.6	21.4	22.1
39	PERCENTAGE CHANGE		0.30	2.16	3.40	2.63	2.79	2.97	2.92	3.45	3.75	3.28
40												
41	TN PER CAPITA INCOME ($)	TPYPC	7228.	7911.	8715.	9534.	10363.	11231.	12149.	13177.	14322.	15570.
42	PERCENTAGE CHANGE		10.39	9.45	10.16	9.39	8.70	8.38	8.17	8.46	8.69	8.71
43												
44	TN POPULATION (THOUS.)	TPOP	4399.	4436.	4467.	4500.	4532.	4565.	4601.	4640.	4682.	4721.
45	PERCENTAGE CHANGE		0.97	0.85	0.69	0.74	0.70	0.73	0.79	0.85	0.89	0.83

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

And while the pricing policies of OPEC and other international sellers have been partially responsible for our inflationary spiral, our foreign trade partners argue that their price increases have been necessary precisely for the purpose of offsetting the fall in their real income associated with continuing U.S. inflation and recurrent devaluations of the dollar.

National forecasters predict no dramatic short-term relief from this inflationary trend, whereas the prices implicit in evaluating the gross national product* are shown by the deflator to have increased by 9 percent in 1979. They will increase by nearly as much, 8.5 percent, in 1980 before dropping nearly a full point to 7.6 percent in 1981. From there they are expected to remain high throughout the duration of the rebound from the current downturn. They will moderate slowly during the remainder of the decade.

The same kind of inflationary pressure which hits the nation also plagues Tennessee. Inflationary pressures are among the easiest to pass through an open economy like ours because of the heavy trading among the states in finished products.** The table of significant indicators bears out the similarities between U.S. and State gross product deflators. In Tennessee, a small one-year drop is anticipated in the growth of the gross product deflator, from 8.6

---

*This is as opposed to prices charged for consumer purchases, which are reflected in the consumer price index. The latter, as expected, increases faster than the GNP deflator.

**This is partly belied apparently by regional price indices. Looking at the urban family budget index among areas for comparable baskets of goods, recently Nashville was registered at an index value of 89 compared to an index of 119 for Boston. However, the yearly rates of growth are comparable between the places, and the difference in levels is largely accounted for by differences in the price of housing.

percent to 8.1 percent in 1980, followed by a larger decline in its growth rate in 1981 to 7.2 percent. This precedes a year of relative stability and then a long-term, gradual dwindling of the inflationary rate. The consequence of slower-than-average growth in current dollar value of the State product in 1980, coupled with the continuing high 1980 inflation, is a decline in the real value of State output for 1980. This is measured in millions of constant dollars, expressed in terms of the purchasing power of the 1972 dollar. This year of decline is followed by a strong rebound into 1981 of 3.5 percent growth, a number higher than any expected during the early 1980's but small in comparison to the growth rates of the 1970's and 1960's. The remaining 1980's are expected to drop back to growth in the high 2 percent range, with an upward drift into the 3 percent range by the late 1980's, consistent with national and state demographic trends.

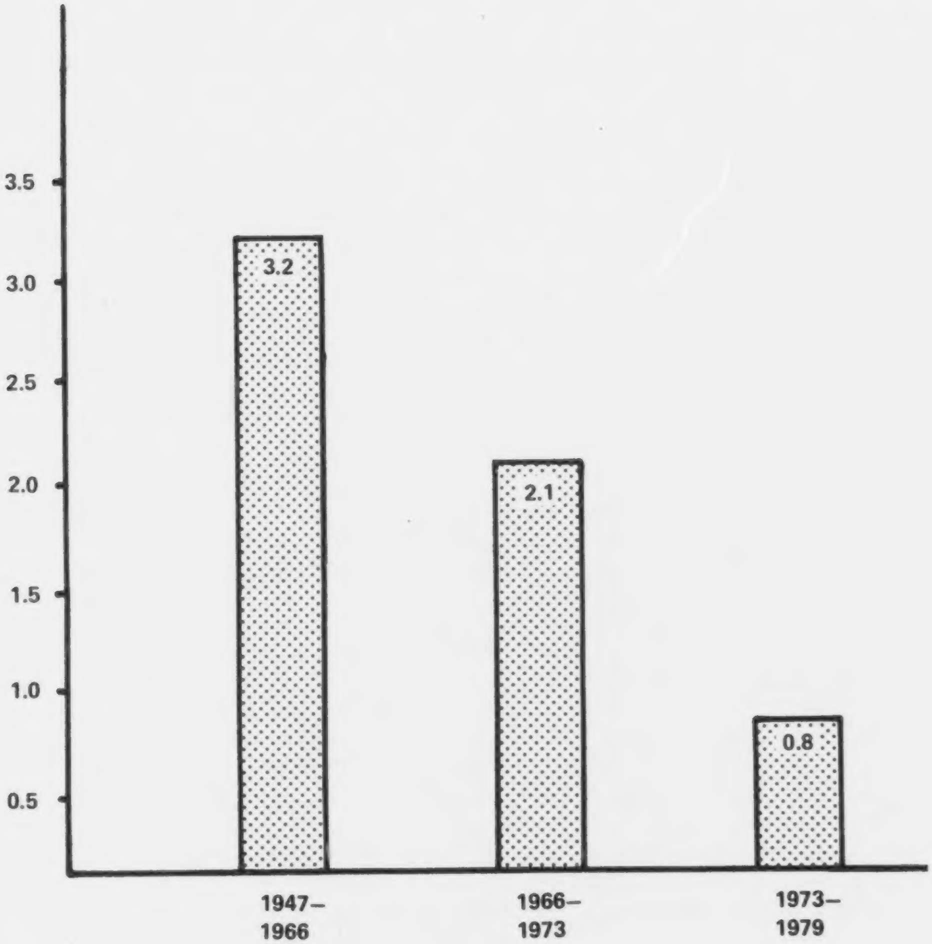
The 1980 decline in real output is the prime manifestation of the projected economic downturn for the State. It is a very modest decline, more representative of a steady-state economy than of a declining economy. Yet its magnitude is hidden by the annual nature of the forecast. On a quarterly basis, the downturn would look much more pronounced and visible. Projected output is expected to decline at a much more rapid rate in the first and second quarter, followed by a relatively stable third quarter and a rebound late in 1980. This will cause short-run cyclical difficulties for the State, for example in collecting revenue from sales taxes. In the downturn, the elasticity of State tax revenues declines sharply, causing problems for the State. Over time, because the State does not make up later for lost revenue in the downturn, the public sector declines in real terms. More significantly it declines in relative terms compared to the private sector. These issues are taken up in summary in the next chapter and in detail in the section on the government sector in Volume 2 of the Economic Report.

The decline in real output is nonetheless associated with some slight growth in employment in 1980. Although seriously down from its trend rate of increase of 3.07 percent in 1979, it is suggested by the forecast in the Economic Report that continuing growth is expected in the order of magnitude of 1.13 percent, the lowest growth (by a small margin) in the decade. Coupled with continuing population growth through migration and higher rates of labor force participation of women, the increase in employment is insufficient to maintain the (relatively) low annual unemployment rate of 6 percent reached in 1979, itself up from 5.8 percent in 1978 because of the cycle in the last half of the year.

The result of the downturn, expectedly, is a decline in productivity of the Tennessee labor force of about $50 per employee (1972 constant dollars). This is not significant as a single number. It is, however, a dramatic drop when multiplied by the number of employees. It is also significant when the productivity decline is compared to trend growth rates. These have shown productivity to have increased generally since World War II at compound rates averaging 2.5 percent annually. The productivity decline is particularly significant in the context of past high productivity growth when it is put in chronological perspective. It comes on the tail end of a succession of long-term reductions in the positive productivity growth which the U.S. and Tennessee have experienced. In the nation, productivity has declined over the years as shown in Figure 1, from 3.2 percent during the years 1947-1966, to 2.1 percent from 1966-1973, and finally to 0.8 percent from 1973-1979.

FIGURE 1

NATIONAL PRODUCTIVITY
(Compound Annual Rates of Growth)



SOURCE: **Fortune**, December 3, 1979, p. 69.

Such productivity is a function of the general business cycle. It falls in the downturns when employers do not lay off all of their unproductive employees because of training and search costs which they would later incur in replacement of labor during an eventual upturn. This pattern is reinforced as well because employers share in payment of unemployment compensation costs. Still, it is an unsettling short-term forecast to observe the decline in Tennessee productivity which has been a critical factor for the State in holding its own against other states. It is unsettling for the nation in dealing with export markets. Over the long run, it is projected by the Economic Report that Tennessee productivity (historically higher than the U.S.) will fall relative to U.S. productivity. However, Tennessee productivity does not decline so rapidly that it will fall behind the U.S. by the end of the next decade. There will be nevertheless almost a complete convergence between the two series.*

After accounting for changes in employment and productivity, the factors jointly imply an increase in total personal income within the State, even in real terms. Personal income is projected to grow over the pending downturn by as much as 1.6 percent in 1980, down from 2.1 percent in 1979. A rebound from the downturn results in above-trend income growth in 1981 from which it settles into a long-term projection, reflecting demographic change, energy price and availability, and other factors, of 2.8 to 3.0 percent annual growth.

---

*In fact, the data on Tennessee productivity presented in Table 1 is consistently high relative to the U.S. because it includes as part of manufacturing output, expenditures by manufacturers on nonmanufacturing activities such as advertising, insurance, telephone, research, overhead, etc. The U.S. data are derived from the National Income and Product Accounts of the Department of Commerce and the Tennessee data are derived from the value added series of the Annual Survey of Manufactures, Bureau of the Census. The effect of this noncomparability is to understate the U.S. levels of productivity by approximately 26 percent (based on calculations for 1976) or conversely to overstate Tennessee approximately by 26 percent.

The National Outlook

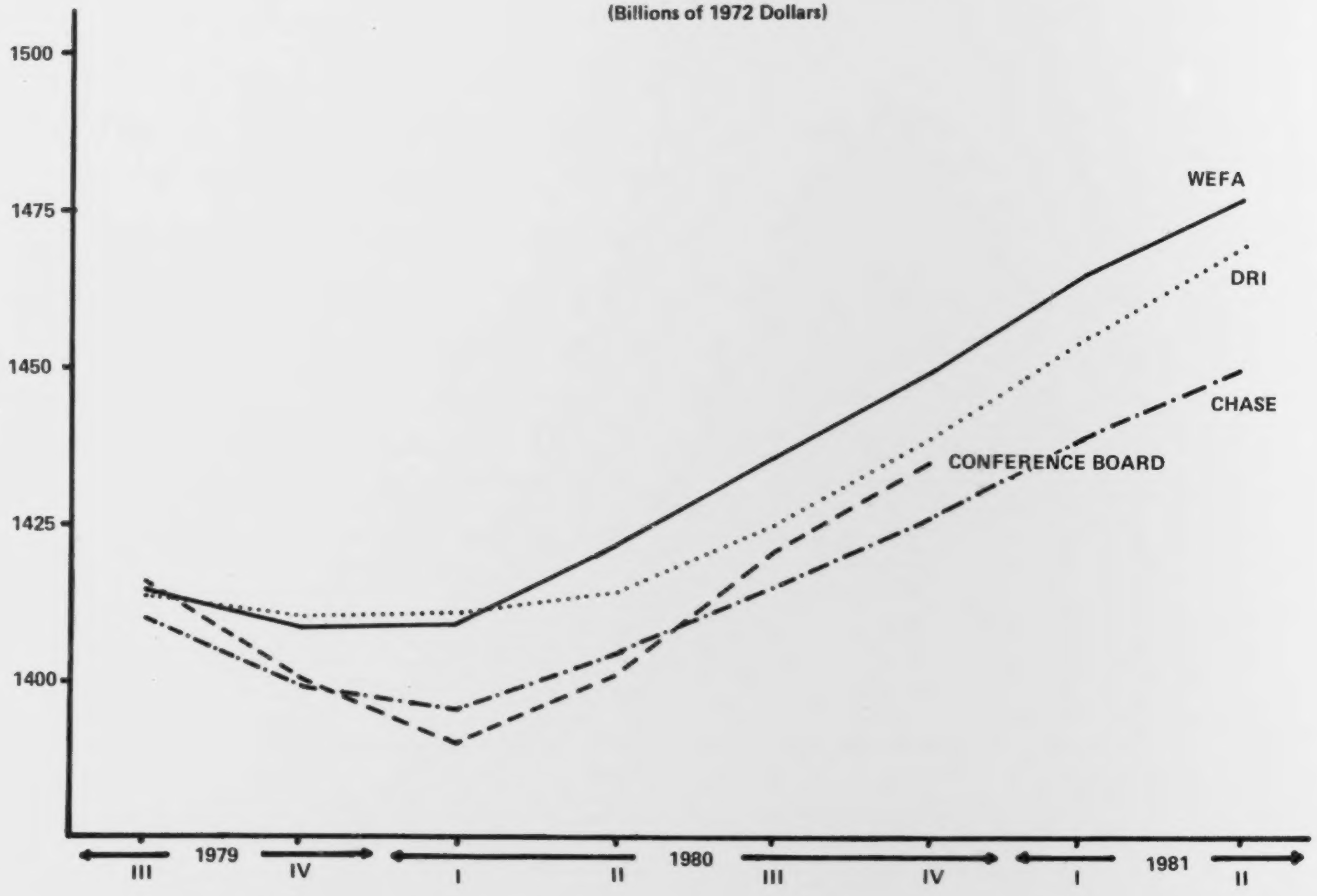
As argued earlier, there is an uncanny consistency to the national forecasts even in these uncertain times--the major forecasts uniformly point to an imminent economic downturn. There is, of course, some variation among the alternate views. Some are more pessimistic than others. Some foreshadow a potential industrial policy of laying off unproductive workers in which case high unemployment rates will follow; others argue that the economy will find an outlet in industrial retention of employees, letting productivity fall.

The Conference Board reports forecasts of several prominent forecasters, among whom are Data Resources, Inc. (DRI), Wharton Econometric Forecasting Associates (WEFA), Chase Econometrics, and the Conference Board itself. Forecasts of this group are shown in Figures 2, 3, and 4 comparing outlooks on gross national product, unemployment, and the gross national product deflator, respectively. The diversity of these August forecasts is as apparent as their prediction of a downturn.

All show unemployment rates increasing approximately from 6 percent to over 7 percent in the next year, although the forecasts of DRI, the Conference Board, and WEFA are more optimistic than the Chase Econometric forecasts. All similarly show at least one-quarter of decline in real national output, although WEFA and DRI then show an immediate return to growth. The Conference Board forecast, optimistic in terms of the national unemployment rate, is interestingly

FIGURE 2

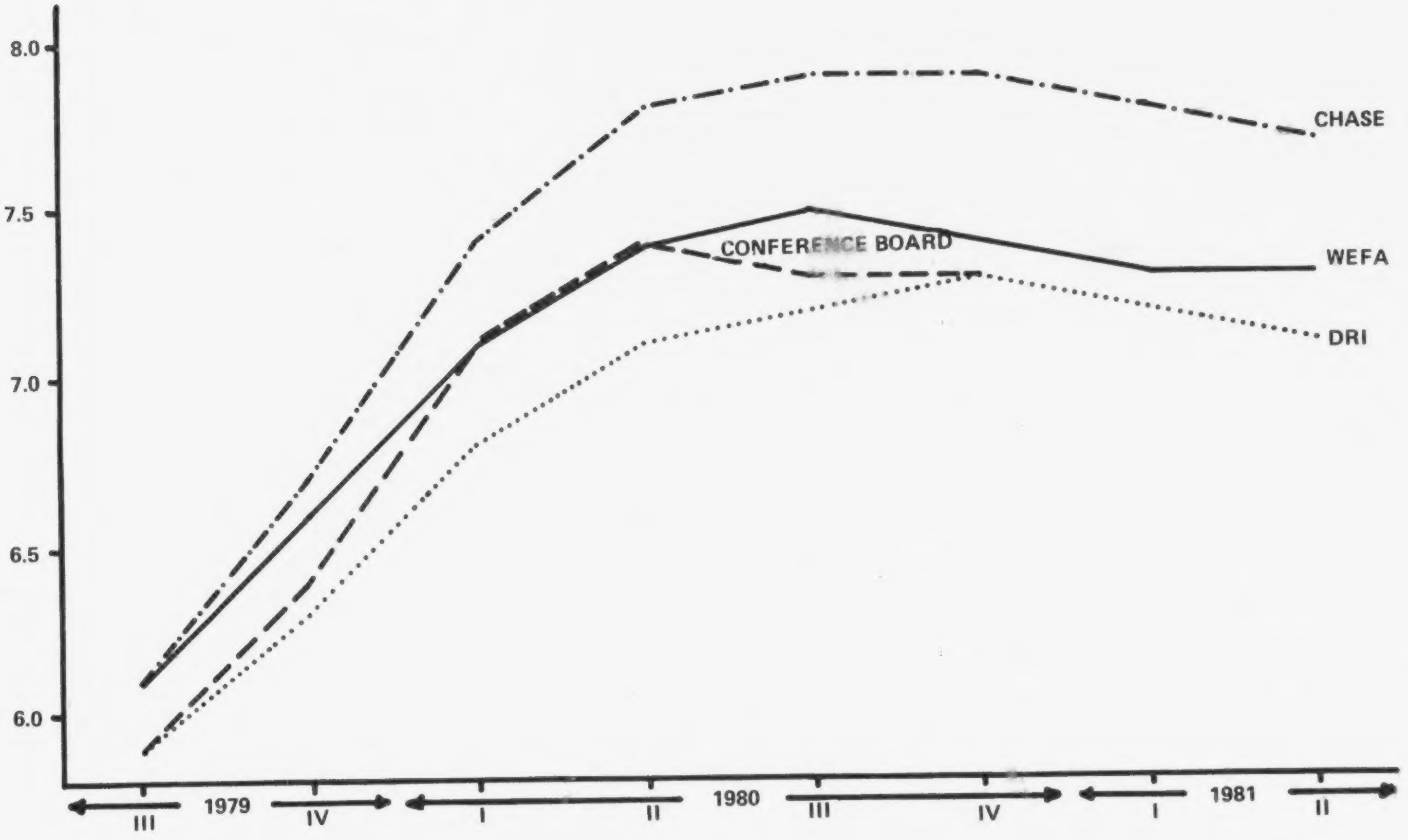
QUARTERLY GNP ECONOMIC FORECASTS
(August 1979)
(Billions of 1972 Dollars)



SOURCE: "Statistical Bulletin," The Conference Board, Vol. 12, No. 9, September 1979, p. 8–9.

FIGURE 3

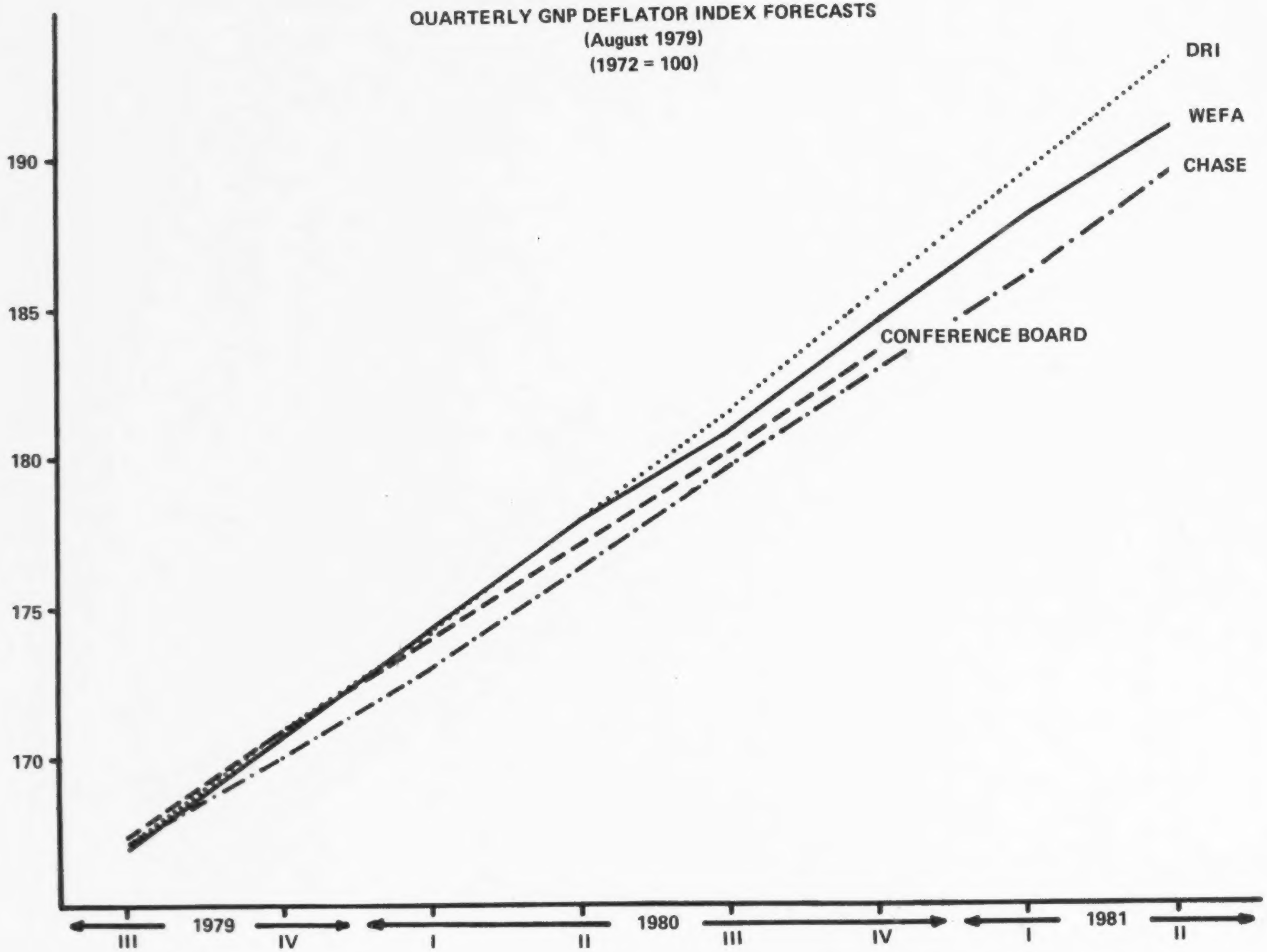
QUARTERLY NATIONAL UNEMPLOYMENT RATE FORECASTS
(August 1979)
(Percent)



SOURCE: "Statistical Bulletin," The Conference Board, Vol. 12, No. 9, September 1979, p. 8–9.

FIGURE 4

QUARTERLY GNP DEFLATOR INDEX FORECASTS
(August 1979)
(1972 = 100)



SOURCE: "Statistical Bulletin," The Conference Board, Vol. 12, No. 9, September 1979, p. 8–9.

the most pessimistic in terms of output forecasts. Their forecast scenario obviously fits the general model of increasing under-employment and falling productivity as industry retains the marginally productive rather than laying them off. All forecasts call for continuing inflation on an unchanging course.

The national forecasts presented in Figures 2, 3, and 4 were produced before October 6, the day the Federal Reserve Bank policies changed to reflect the new stronger Volcker policies. None are up-to-date evaluations of the way that the economy will respond to the newest and most revolutionary economic policy recently instituted. We have had no historical experience with such policies that have so significantly raised interest rates, for example, to the 15-3/4 percent prime rate recently recorded.

There is general agreement that the effect of the tight monetary policies will be to further constrain the economy, fuelling unemployment and hopefully slowing the rate of inflation. How much unemployment will be gained to accomplish what percent reduction of inflation is the unanswered question. This initiative is one to which there has yet been only a partial response. On October 8, 1979, only two days after the Federal Reserve's policy changed, WEFA forecast changes in the national economy suggesting several changes in the next year's, short-term forecast:

- a reduction in real output in 1980 by $12.9 billion
- an increase in the unemployment rate by 0.05 percent
- a slight increase in the inflationary rate because of increased costs of capital spending.

Their forecast, however, neglects to show an improvement in exchange rates which might be forthcoming because of international control of the dollar's stability. These improvements, should they occur, would significantly reduce the U.S. balance-of-payments problem, aid our negotiations with OPEC on future energy prices, and have a generally positive, pervasive influence on the rate of inflation. Until a handle on this impact is achieved there is little the forecasters can do to provide more accuracy.

In light of this concern and the fact that the long-term, annual WEFA forecast does not reflect the October Federal Reserve Bank changes, a significant caveat is placed on the body of the current national analysis. Although the elements of the national forecast presented herein are too optimistic, the Tennessee forecast presented herein reflects the downturn anticipated because of the October 6 changes in monetary policy. Nonetheless, where comparisons between the national and State forecasts are made in this Report, the national economy will look artificially strong.

The National Climate for Economic Growth

This year presents more difficulties to the economic forecaster than any in recent times. The Federal Reserve's changing monetary policy has already been mentioned, but other factors also abound.

A major uncertainty is created by the recent Middle-East crisis led by the Iranian confrontation. This will affect OPEC relations with the United States for some time into the future. At a time when the control which OPEC could muster on the U.S. economy was only beginning to be understood, the new political instability accompanying the Iranian situation voids all that has been learned. The foreign energy uncertainty, coupled with other uncertainties about domestic Tennessee energy in a year in which Tennessee (TVA) electrical rates are being reconsidered in broad new conceptual developments, makes energy a critical, imponderable element of the forecast.

Finally, there is more real possibility for direct confrontation this year between the Carter Administration fiscal policy and Federal Reserve monetary policy than there ever has been before. Our experience is limited in determining the relative power of the two types of policies. It is difficult to predict a winner in a struggle between the two. Monetary policy will continue to be thrust at the high, escalating and unabated rate of inflation. Fiscal policy is likely to maintain a goal of reducing unemployment, perhaps even more so in a national election year than it would otherwise. Conflict between the two could become serious.

Monetary Policy

Monetary policy of the Federal Reserve Bank Chairman Volcker has been revolutionary in at least two dimensions--(1) monetary policy will be applied over all periods, not just during economic downturns and (2) the new focus of monetary policy will be on banking system reserves rather than on interest rates (specifically the Federal funds rate). Overall the move on October 6, 1979, contained three specific provisions:

- raising of the discount rate from 12 to 13 percent
- requiring an 8 percent marginal reserve on "managed liabilities," such as Edge Act Corporations, U.S. agencies and foreign branch banks (including time

deposits, Eurodollar borrowings and Federal funds borrowing)

- enforcing policy with a trigger on reserves rather than on the Federal funds rate.

From this policy, hope arises that the growth in money supply will slow dramatically and rates of interest, e.g., the prime rate, will fall rapidly from recent all-time highs. This is considered to be true whether money supply is measured broadly to include select time deposits (the monetary definition of M2) or narrowly to include only currency and demand deposits (M1). WEFA forecasts of M1 and the prime rate are shown by quarter in Figures 5 and 6.

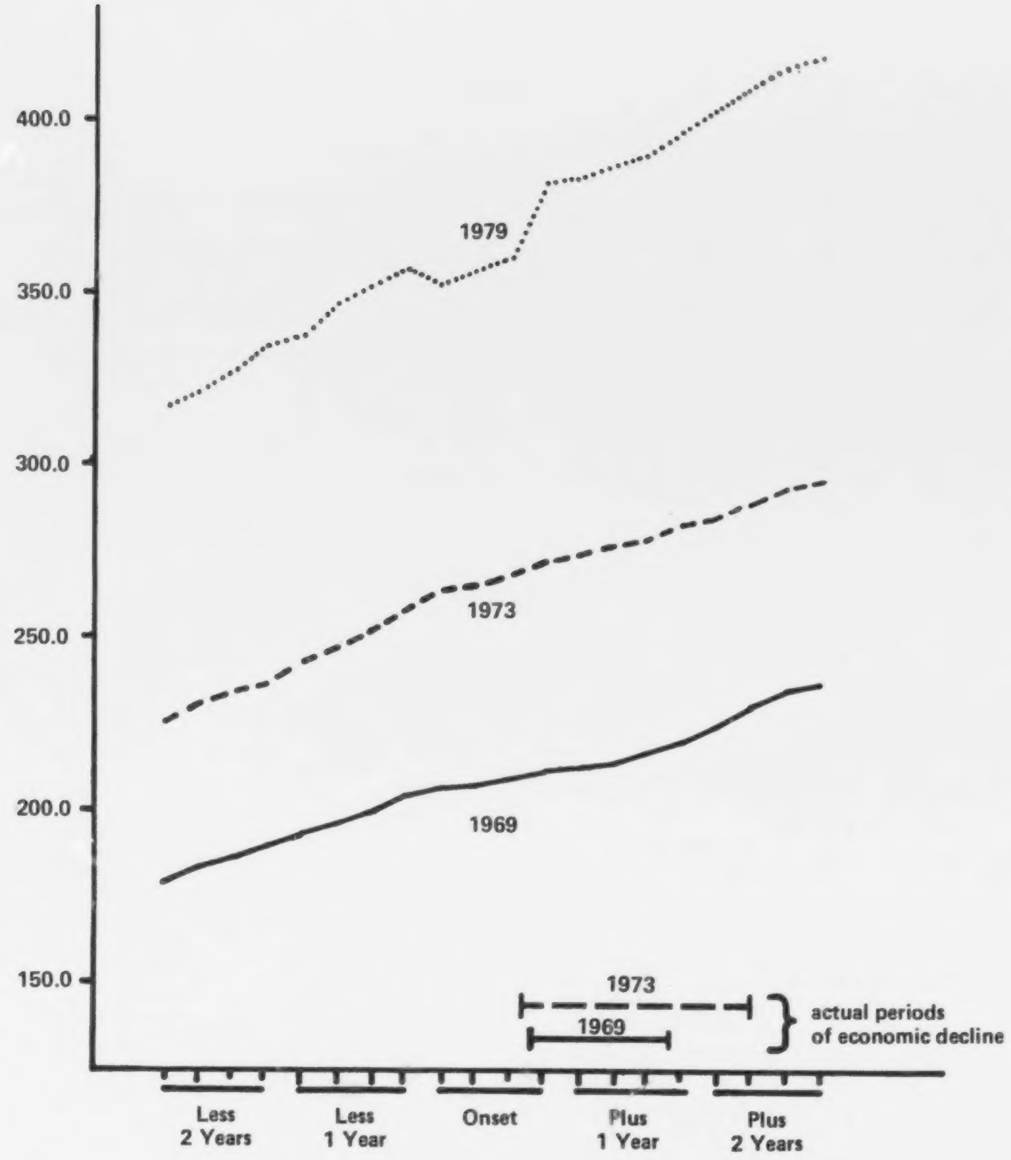
These two figures, as others presented later, show the historical and projected data respectively, around the years 1969 and 1973, and 1979. This is done to facilitate comparisons between this year's projected economic downturn and the two most recent national declines. Each line represents 5 years worth of data, centered in the different cases on the years 1969, 1973, and 1979.* The actual national downturns did not coincide with any of the calendar or fiscal years. The national decline associated with the 1969 recession occurred over the period from December 1969 through November 1970; the decline in the 1973 recession occurred in the period November 1973 through March 1975. In 1979, only time can put the historical perspective on the actual period of decline. In Figures 5 and 6, the periods of national decline for 1969 and 1973 are shown at the bottom of the figures.

---

*This implies, for example, that by the line in Figure 5 which refers to 1979 is shown the WEFA data on M1, for each of the years 1977 through 1981.

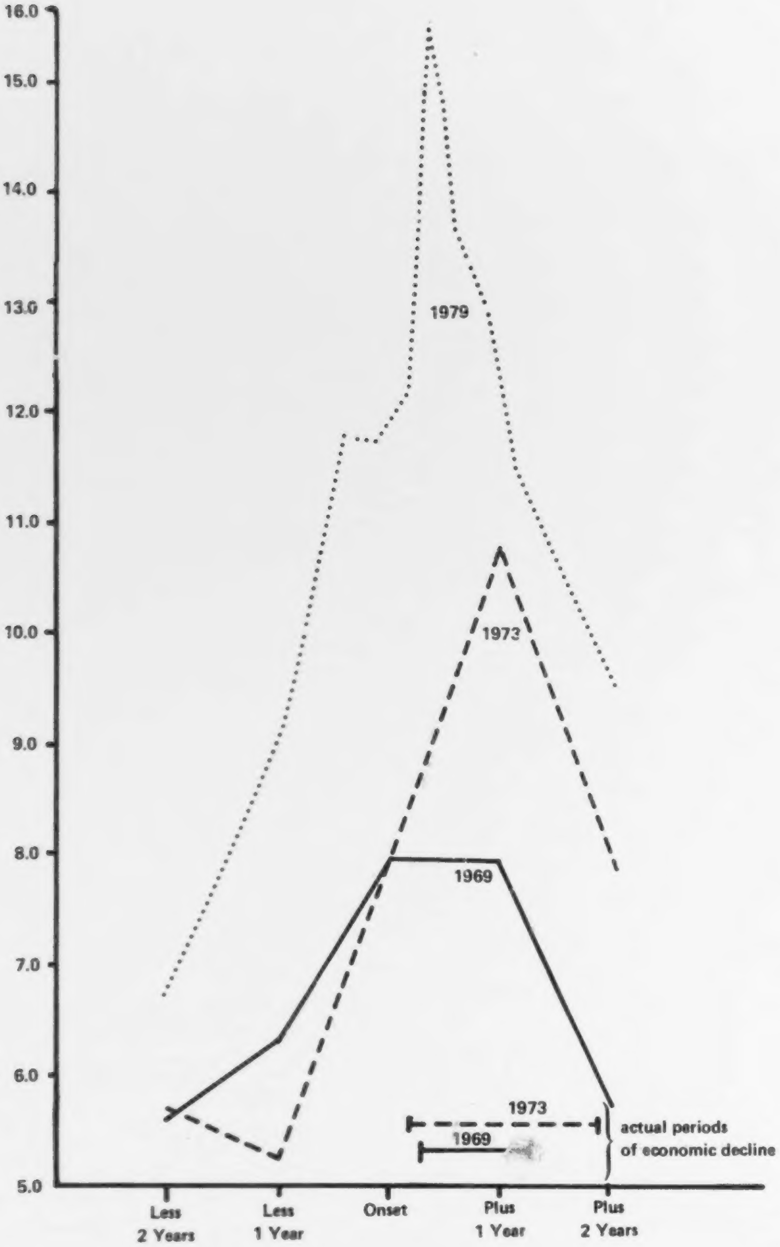
FIGURE 5

BEHAVIOR OF NATIONAL MONEY SUPPLY (M1)
IN RECESSIONS
(Billions of Dollars)



SOURCE: Historical Data – **Business Conditions Digest**, U.S. Department of Commerce, various issues; Forecast Data – Wharton Econometric Forecasting Associates, October 8, 1979.

FIGURE 6
BEHAVIOR OF NATIONAL PRIME INTEREST RATE IN RECESSIONS
(Percent)



SOURCE: Historical Data – **Economic Report of the President 1979**, p. 250; Forecast Data – Wharton Econometric Forecasting Associates, October 8, 1979.

It is readily apparent that one of the distinctions between 1969 and 1973 was in monetary policy. In 1969 there was a diminution of the money supply, whereas in 1973 there was no departure from high quarterly growth. In 1969, the decline in the growth rates of money supply occurred before the onset of the recession and of course in 1973, it did not since there was no decline. In 1979, with the new rates of M1 growth projected to fall from 10.04 percent increase in 1979.3 to 2.43 percent in 1979.4 and to 1.62 percent in 1980.1, the trends look auspicious so that the national downturn may be more modest than the 1973-75 period of decline.

In 1980, the prime rate is projected to move smoothly down from its high of 15-3/4 percent and back into the 9 to 10 percent range within two years. While this trend is sharper, so that it is more directly analogous to the 1973 trend, the 1979-1980 experience is expected to be more like 1969 since in 1969 the money supply peaked before the onset of the downturn.

Further, and this is the area of current controversy, the national prime rate may not fall so smoothly as shown in Figure 6. Rationale for this goes back to an understanding of the Federal Reserve's purpose in tightening up the money supply. If that purpose was to break the back of the inflationary psychology that grasped the nation all through the stagflation of the 1970's, then the Fed's purpose may not be so simply served as in jacking rates to levels without precedent and then dropping them smoothly and quickly back to the original levels.

The inflationary psychology has always been "buy now while lending rates are low" and "mortgage or borrow to the hilt and allow your income to grow to cover principal and interest payments." This psychology has proven all through the 1970's, for example, that the $30 to $40 extra investment used to buy rather than to rent a home can be turned into 1000 percent or more growth in equity when considered as a return on the additional investment. It is difficult and will be difficult to divert such thinking of investors.

The Federal Reserve Bank's policy is two-pronged. First it will reduce M1 to raise interest rates to such extremes that investors take seriously a change in federal goverment policies which historically have seemed more interested in unemployment policies than anti-inflationary policies. If prong one does not work, the Fed will drop back only slightly but maintain high rates for as prolonged a period as necessary to make investors take the new policies seriously. The national forecast depicted in Figure 6 is an implicit subscriber to the theory that the short, high interest rate policy will work. By contrast, the Economic Report's forecast is a subscriber to the national perspective that sustained high interest rates will be required. This will forestall the immediate long-term decline in interest rates, perhaps through the middle of 1980.2 or into 1980.3. At that time, the rates will begin to fall and with them the rate of inflation. Simultaneously the real growth rate will be pushed in the other direction, upward.

Such a conclusion must be recognized for its impact. Resort to the policy of sustained high interest rates will lead to a longer, more pronounced downturn, both nationally and for the state. Without it, the competitiveness of the dollar in foreign markets, our ability to withstand the pressures of OPEC, the stability of domestic money markets, all will suffer. With sustained high interest rates there will be thousands of potential workers temporarily without jobs. As a nation and as a state we must ask ourselves whether the benefits are sufficiently high that we can bear the costs.

U.S. and OPEC Energy Policies

Energy is the second major factor which makes this year's forecast more difficult and risky relative to other years. Nationally, it has been noted for the U.S. and corroborated for Canada that the impact of an increase in $1 per barrel in foreign oil prices is a 0.5 percent increase in the national consumers' price index. Extending this logic over the period from 1973 to 1978, of the 62.2 point rise in the U.S. CPI, some 15 points of the total increase may be attributable to oil price changes. In this way foreign oil interests have accounted historically for nearly one-quarter of all recent U.S. inflation.

National forecasts are projecting 8 percent annual rates of increase in world oil prices throughout the decade. The effect of this price increase would hold U.S. growth in energy consumption to 1.4 percent annually, a slower growth than ever before experienced. Just as the energy crisis was projected to be at fault in the declining rates of productivity growth through the mid-to-late-1970's, slower growth in energy consumption may perpetuate the trend. As a nation there will be more emphasis on substituting other factors, including labor, for energy in production, causing the labor productivity to fall.

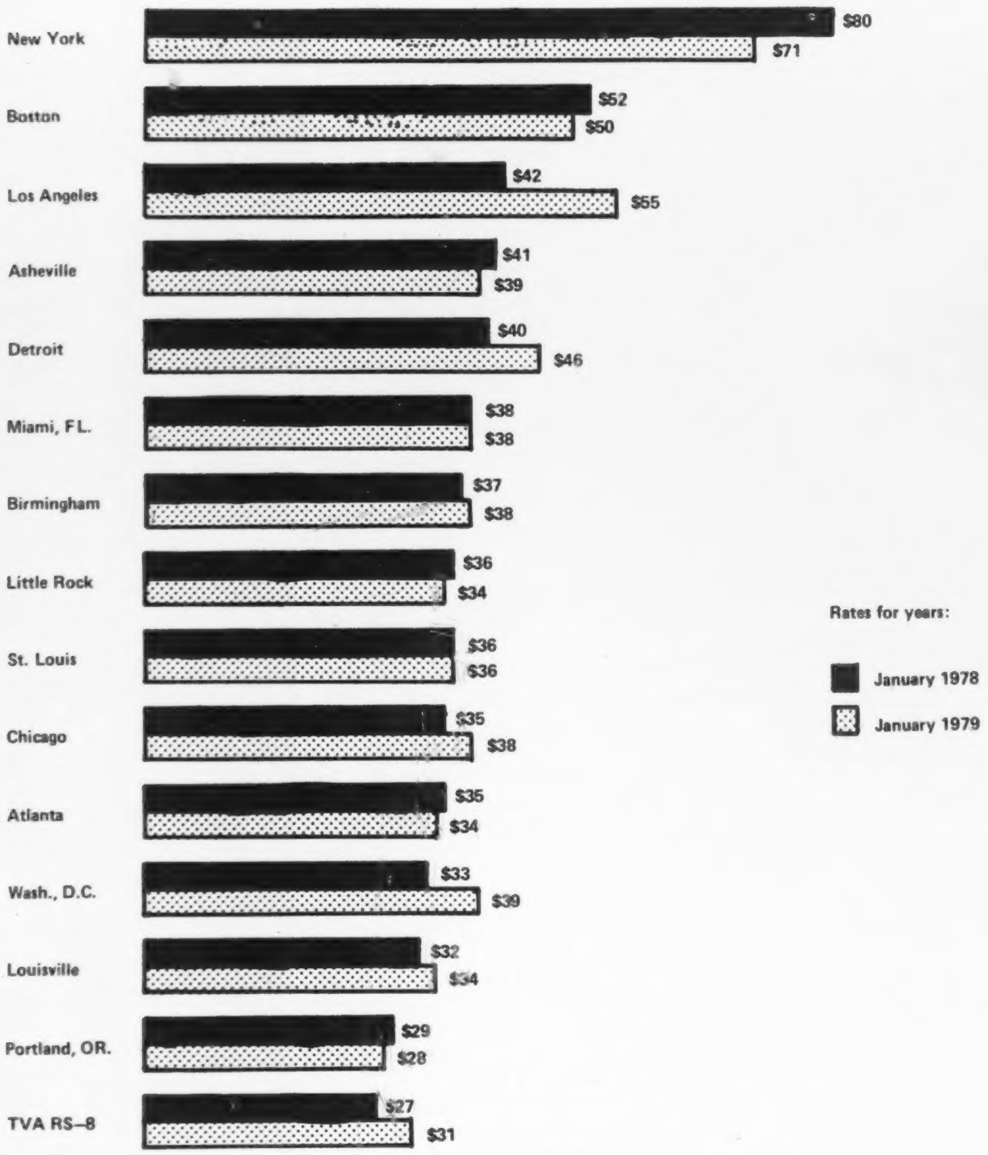
It is not reasonable to argue strongly that the U.S. has learned what to expect from future OPEC economic policies. Recently OPEC has provided stability to the Middle-Eastern political and economic situation, but this may change as a result of the Iranian crisis. This major unknown has not been factored into this year's forecast and therefore the assumption is necessary that the U.S. can replace the small (6.0) percent of U.S. oil imported from Iran with oil found in other places. This must be done without significantly changing the world prices anticipated before the crisis.

In Tennessee, of course, energy prices are critical because of the dependence of many of its manufacturing producers on energy-intensive processes. Each of the shocks of major price changes in foreign oil that hit the nation eventually filter through to affect Tennessee. They directly have only a small impact on electricity prices because TVA uses very little oil for electricity production and then primarily for peaking capacity. Nevertheless, the competitive position of the State in manufacturing production depends in part on the relative prices of Tennessee and non-Tennessee energy, regardless of fuel source. Despite the oil price hikes (perhaps because of them), Tennessee electricity has lost its charm of having the cheapest electrical rates in the nation. In Figure 7 is shown a comparison of 1978 and 1979 TVA rates with non-TVA residential rates. Analysis of Figure 7 points to the slippage in typical TVA residential service rates from their spot as lowest in the nation. While TVA prices per 1000 kwh were increasing $4 between 1978 and 1979, Seattle's were unchanged, leading Seattle to lower prices than TVA supplied Tennessee in 1979.

Whether Tennessee as a sun-belt, heavy energy-producing state can move into a period of restricted energy usage and maintain its

FIGURE 7

RESIDENTIAL RATES FOR ELECTRICAL SERVICE
(Dollars per 1000 kwh)



NOTE: Bills for others are based on residential rate information obtained directly from the utilities. Bills include all currently applicable adjustments and charges except local and state sales taxes. TVA rate level RS–8 is typical of basic residential bills in TVA service area; amount may vary in particular locations due to rate level difference and application of special charges.

SOURCE: **Electricity Sales Statistics**, Tennessee Valley Authority, January1978-79.

position relative to the nation is a question yet to be answered. A recent study utilizing the Tennessee Econometric Model suggests the heavy industrial dependence on energy has been a competitive force which has enabled the State to outgrow the nation. The impact of future energy price changes will be important, whether these impact the State directly or indirectly through the nation.

Fiscal Policy

Since the Great Depression, economists have tried to forecast the impacts of year-to-year swings in fiscal policy reflected by the balance of the federal budget. What has been true historically, however, is that the underlying demographics had provided a straight-line progression slowly increasing the labor force year after year. By the mid-1970's, with the entrance of the full complement of the post-World War II baby boom into the labor market and the return to the labor force of veterans of the Vietnam War, the slow progression gave way to a rapid bulge. This has been blamed as one of the causal factors of the 1973 downturn. It now stands again as a causal factor of the projected 1979 downturn.

Michael Wachter, Professor of Economics at the University of Pennsylvania, has argued that one of the factors contributing to stagflation is the heavy baby-boom component which shows up as young labor in the job market. This youth has less job seniority and is much more mobile because of fewer family ties than the older population. The young are more likely to be laid-off or to leave one job in search of another than are the more mature. As a result, with a just complete influx of the baby-boom cohort into the labor force, both structural and frictional unemployment tends to be higher than it has been historically. Wachter argues that both the administration's fiscal policies and the advice of the President's Council of Economic Advisors have overlooked the demographic trend. Fiscal policies have stressed an objective unemployment rate too low to permit it to be "non-inflationary." Wachter believes the discrepancy between the true non-inflationary unemployment rate in 1979 and the administration's target is 1.2 percentage points (a 6.2 percent unemployment rate rather than a 5 percent rate).

Should fiscal policy remain oriented to an unemployment goal and should it point at targets which are unrealistically low, there may be a growing conflict between fiscal policy and the inflation-oriented monetary policy. Never before have forecasts of the short-term economy had to deal with an issue so hotly contested on both sides. Which will win out in the short and in the long run--monetary or fiscal policy?

The 1980 State Downturn--How Serious?

In the Economic Report is forecast a decline in real Tennessee output of 0.01 percent in 1980. How serious a magnitude is this? Is the economy going to behave more like that which we experienced in 1969 or that in 1973? To gauge what could happen in Tennessee in the next recession, it is useful to review what happened in the State in those past two recessions.

During the 1969-1970 downturn the national economy peaked in December 1969, but employment kept growing in Tennessee until June

1970. From a peak of 1.6 million jobs, employment fell to 1.52 million jobs in February 1971--three months after the bottom of the downturn nationally. In that month unemployment was 5.9 percent of the labor force--the highest rate during the recession.

After February 1971, employment began growing rapidly again, surpassing its pre-recession high by June. Hence the recession was fairly mild, lasted a short time, and the recovery was very rapid in Tennessee. By the end of 1971 unemployment dropped back to its pre-recession monthly average of 3.9 to 4.1 percent.

The 1973-75 recession was more serious both nationally and in Tennessee. Nationally the cyclical peak occurred in November 1973. Nonagricultural employment continued to expand in Tennessee until April 1974, when it stood at 1.6 million jobs. It then fell steadily for eleven months to a figure of 1.45 million. About 150,000 nonagricultural jobs were lost between the peak and trough, compared to under 80,000 lost during the 1969-1970 recession.

Unemployment was a more serious problem in the 1973-75 recession; not only because of the greater number of jobs lost but also because the state's labor force was growing so rapidly. In 1974-75 more women and young workers were looking for jobs than during the 1969-1970 downturn. This served to inflate the State's unemployment figures above what might otherwise have been expected. The unemployment rate, which had been averaging between 4 and 5 percent each month, shot up to 6 percent in November 1974 and to 9 percent in January 1975. It peaked at 9.8 percent in March and fell very slowly during the rest of the year. By August 1976, it returned to its pre-recession level of about 5 percent. Although Tennessee's overall unemployment rate never exceeded the comparable national figure for any prolonged period, its abrupt increase swamped the labor markets, even in the State's biggest cities, and led to long lines at the unemployment offices. At the height of the recession, unemployment exceeded 20 percent of the labor force in many rural counties.

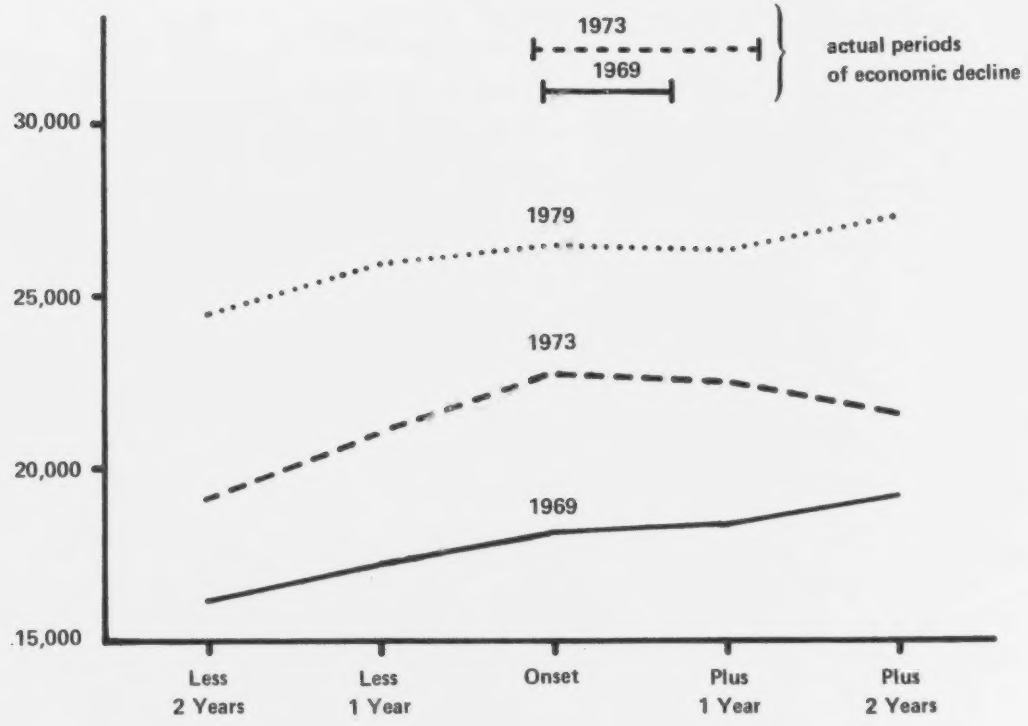
During the 1969-1970 recession, personal income continued to expand in real terms. Despite accelerating inflation and the recession, most Tennessee workers remained relatively unaffected by the national slowdown. Such was not the case, however, during the 1974-75 recession. As inflation zoomed into double-digit figures in 1974, real personal income declined, both in Tennessee and nationally. The recession worsened in 1975, causing real personal income to continue its decline. The State experienced no growth in personal income from 1973 to 1975 when the effects of inflation were removed. Nearly all workers in the State, whether employed or unemployed, felt the combined effects of inflation and recession. This situation worsened the lot of every worker--not just those who were unfortunate enough to lose their jobs.

Figures 8, 9, 10, and 11 show the historical movement of key variables in 1969 and 1973 periods and in the current period. These figures focus on four primary indicators of economic health--gross state product, unemployment rate, and durable and nondurable manufactured goods output. For comparison with the U.S. economic performance during the same time periods, Figures 12, 13, 14, and 15 repeat the same four primary indicators for the major recent recessions.

FIGURE 8

BEHAVIOR OF TENNESSEE GROSS STATE PRODUCT IN RECESSIONS

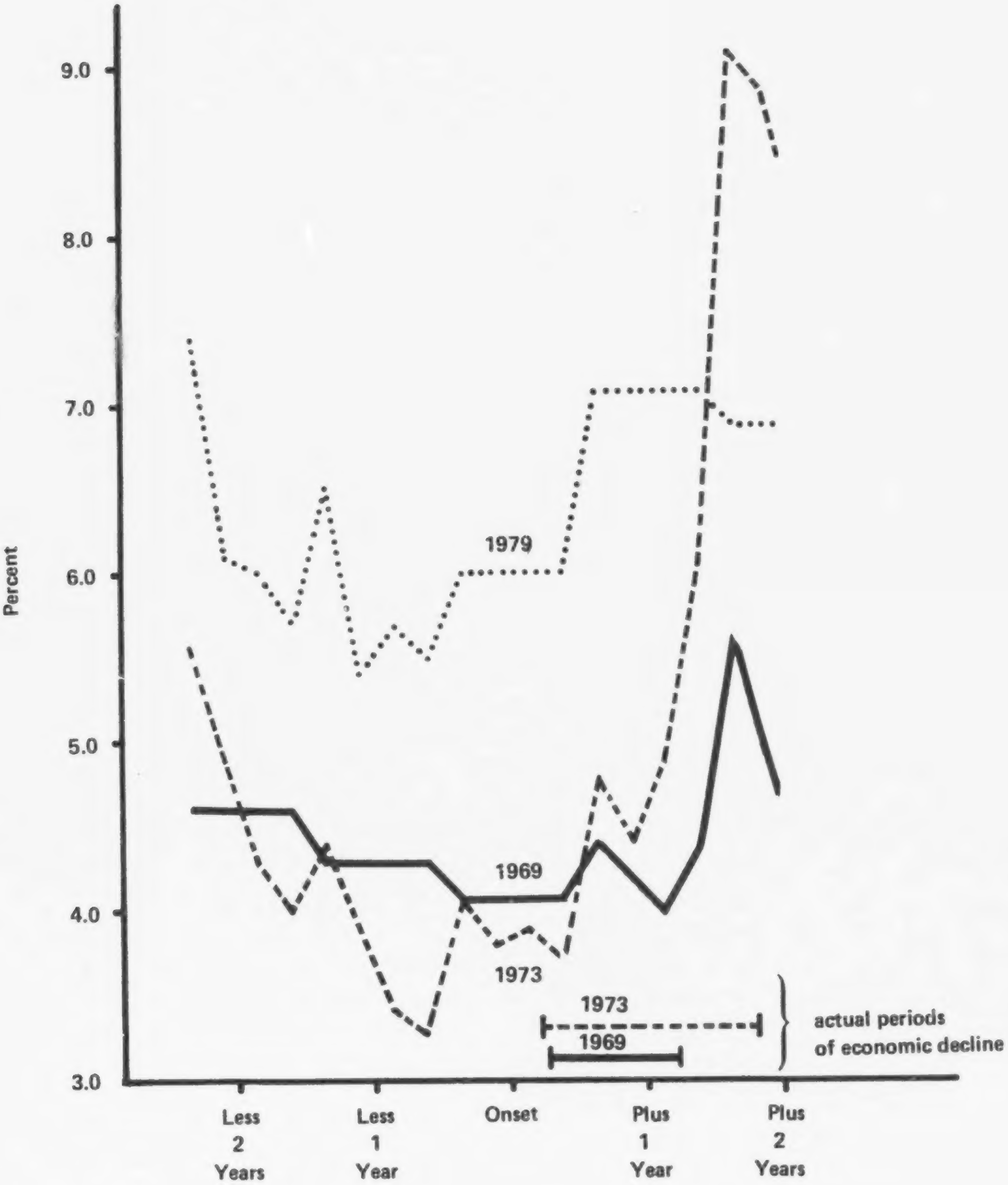
(Millions of 1972 Dollars)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 9

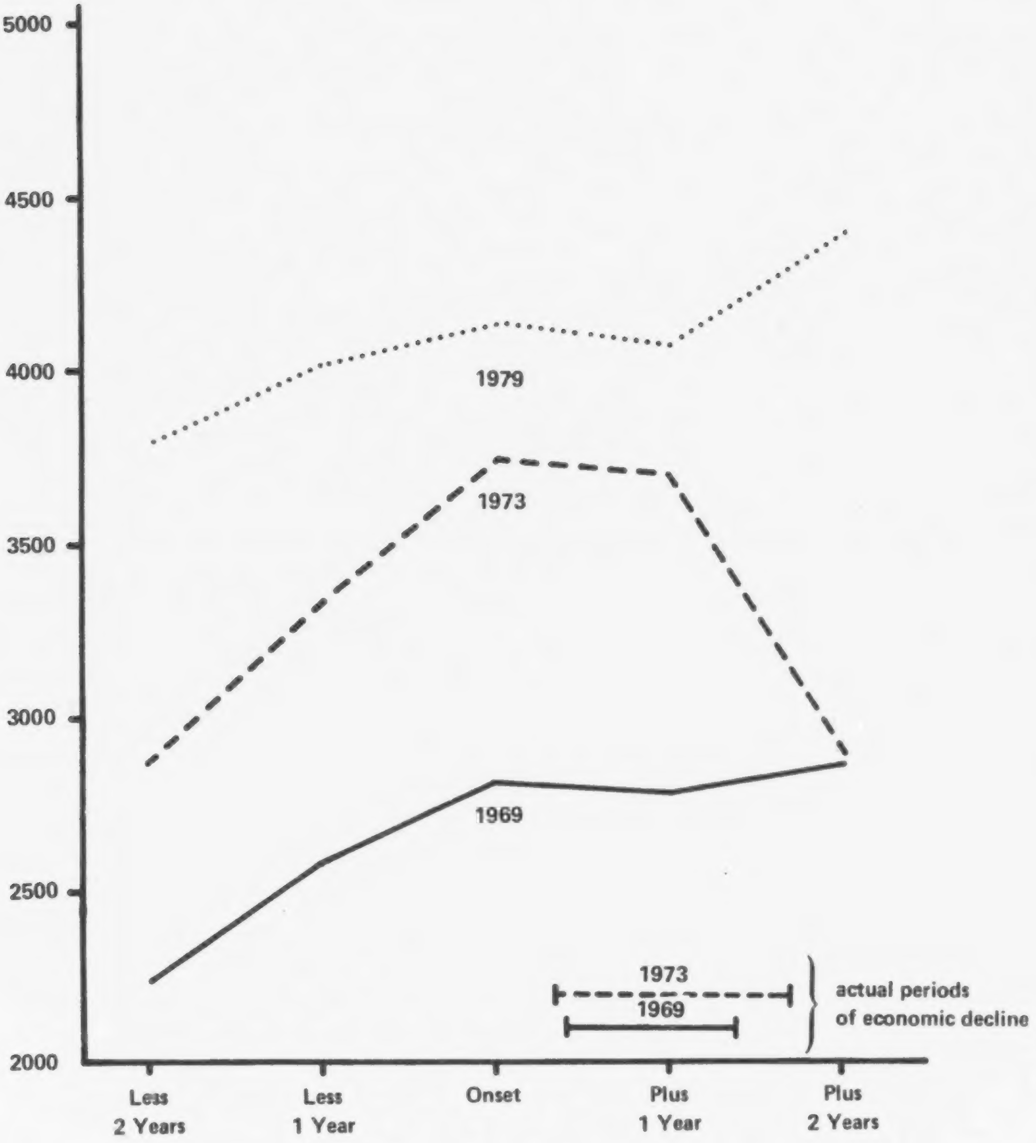
BEHAVIOR OF TENNESSEE UNEMPLOYMENT RATE IN RECESSIONS



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

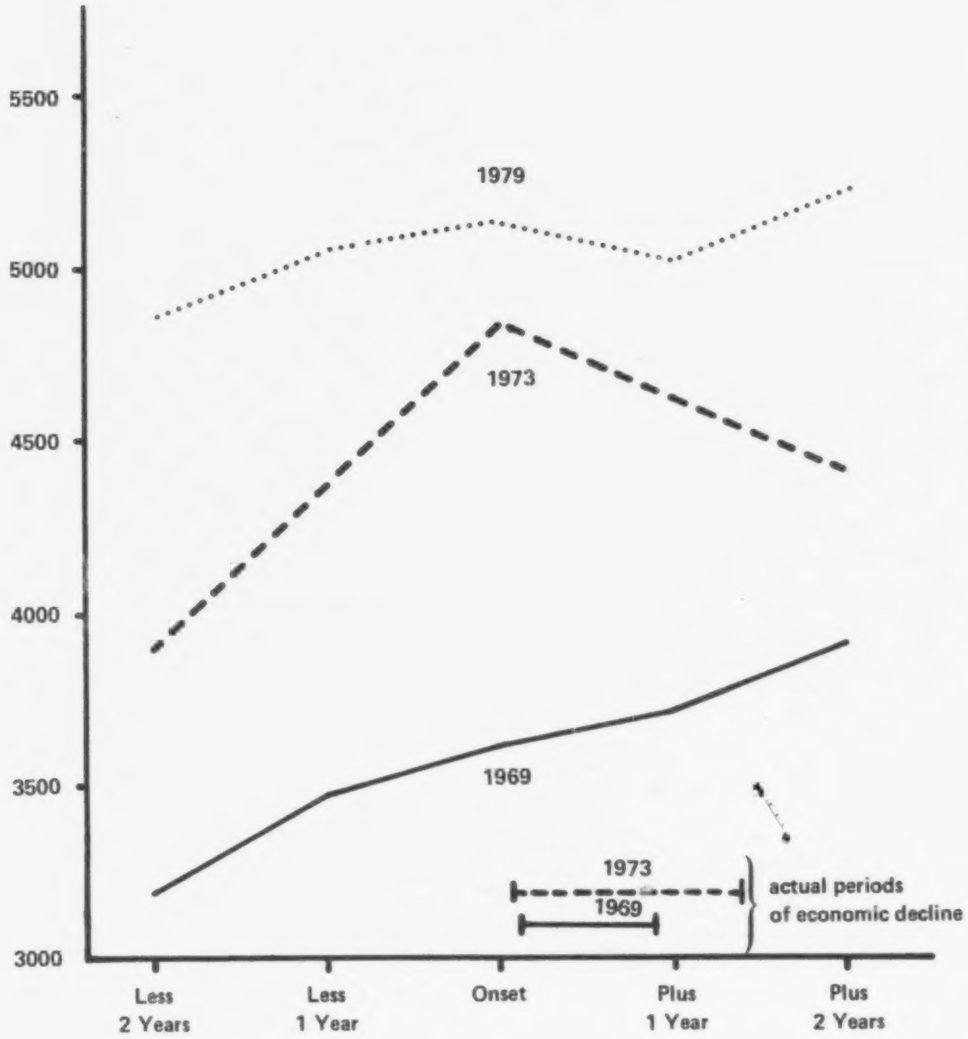
FIGURE 10

BEHAVIOR OF TENNESSEE DURABLE GOODS OUTPUT IN RECESSIONS
(Millions of 1972 Dollars)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

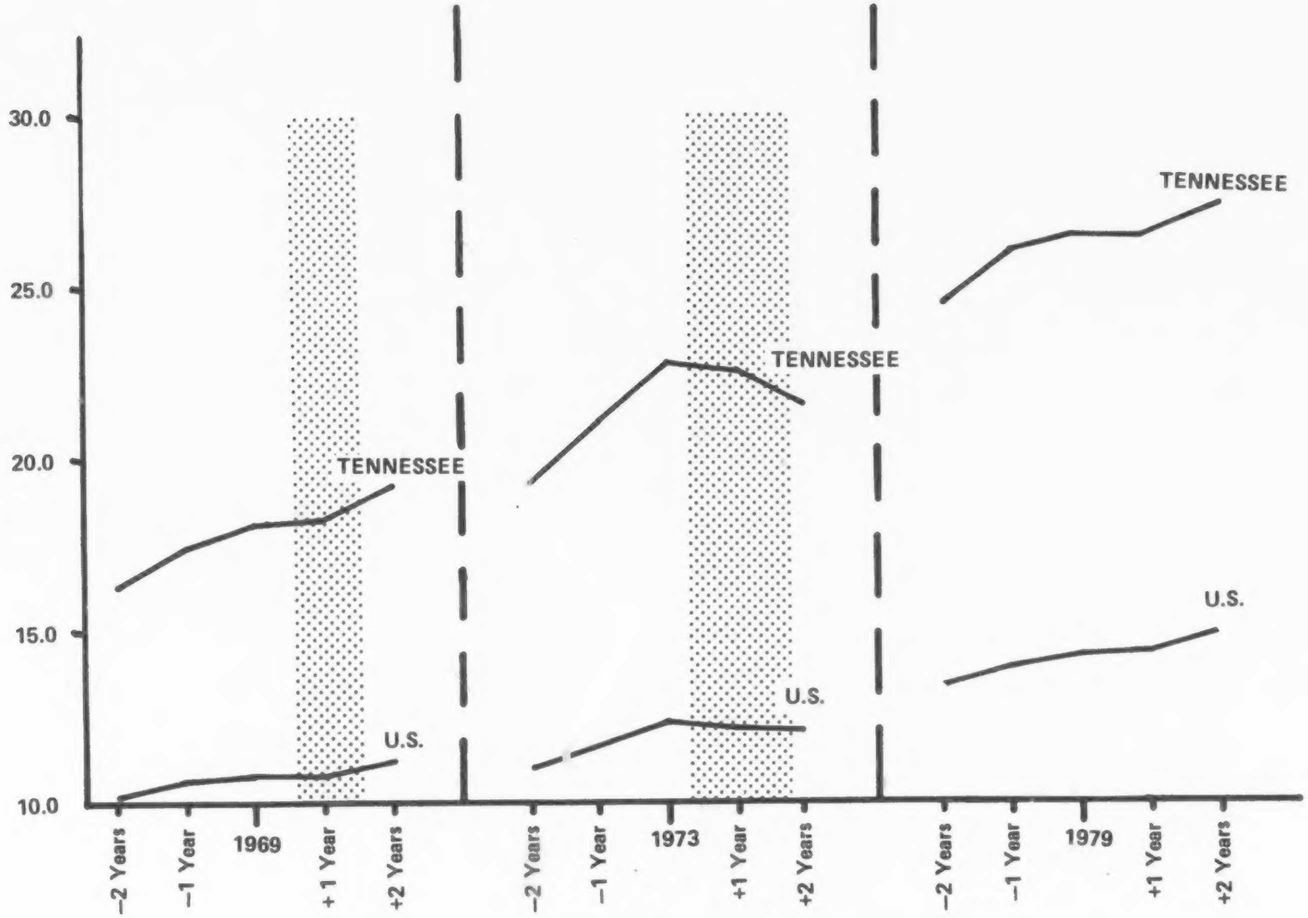
FIGURE 11
BEHAVIOR OF TENNESSEE NONDURABLE GOODS OUTPUT IN RECESSIONS
(Millions of 1972 Dollars)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 12

RELATION OF TENNESSEE GROSS STATE PRODUCT (in 1972 Dollars) TO U.S. GROSS NATIONAL PRODUCT
(Tennessee, Billions; U.S., Hundred Billions)

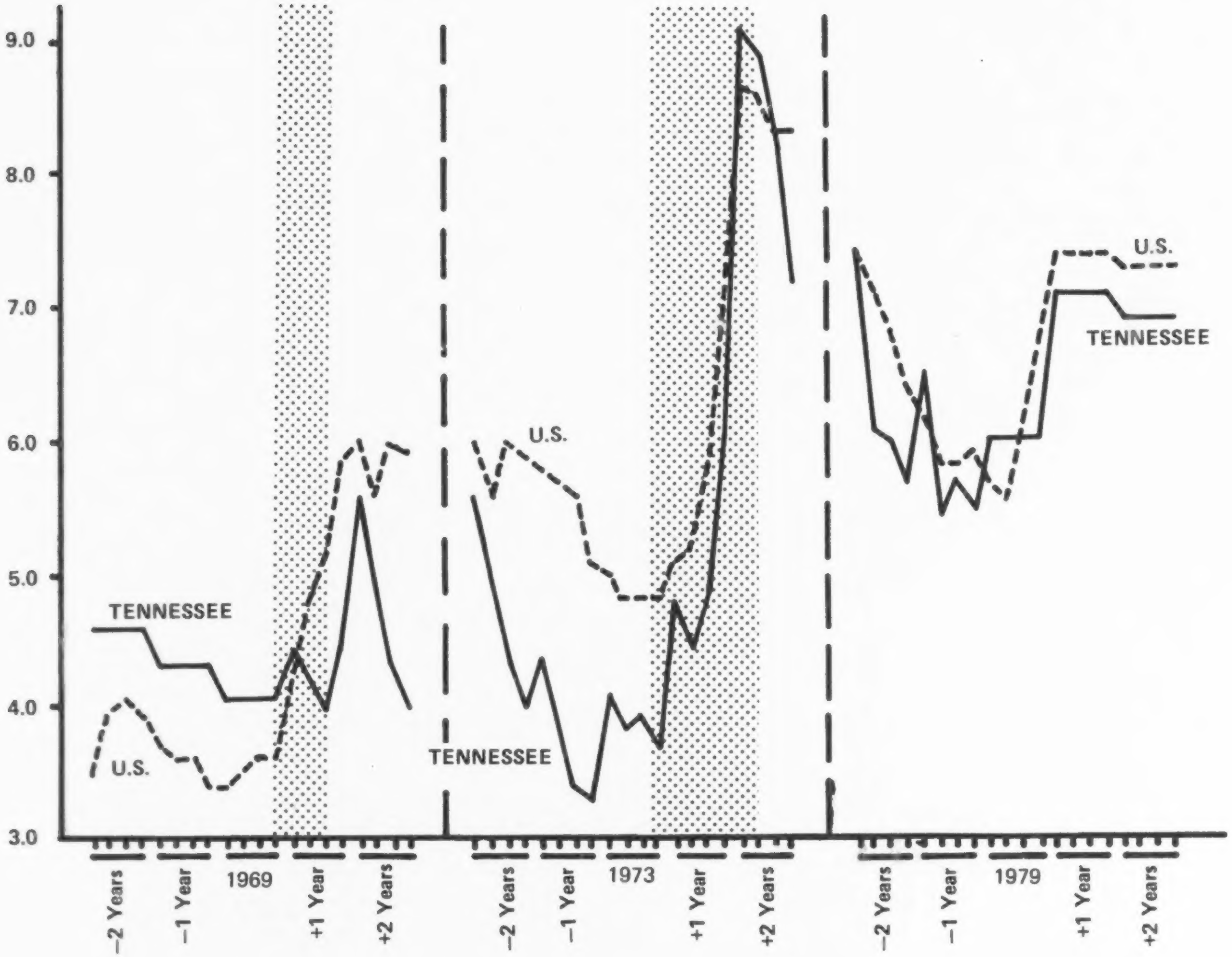


SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 13

RELATION OF TENNESSEE UNEMPLOYMENT RATES TO U.S.

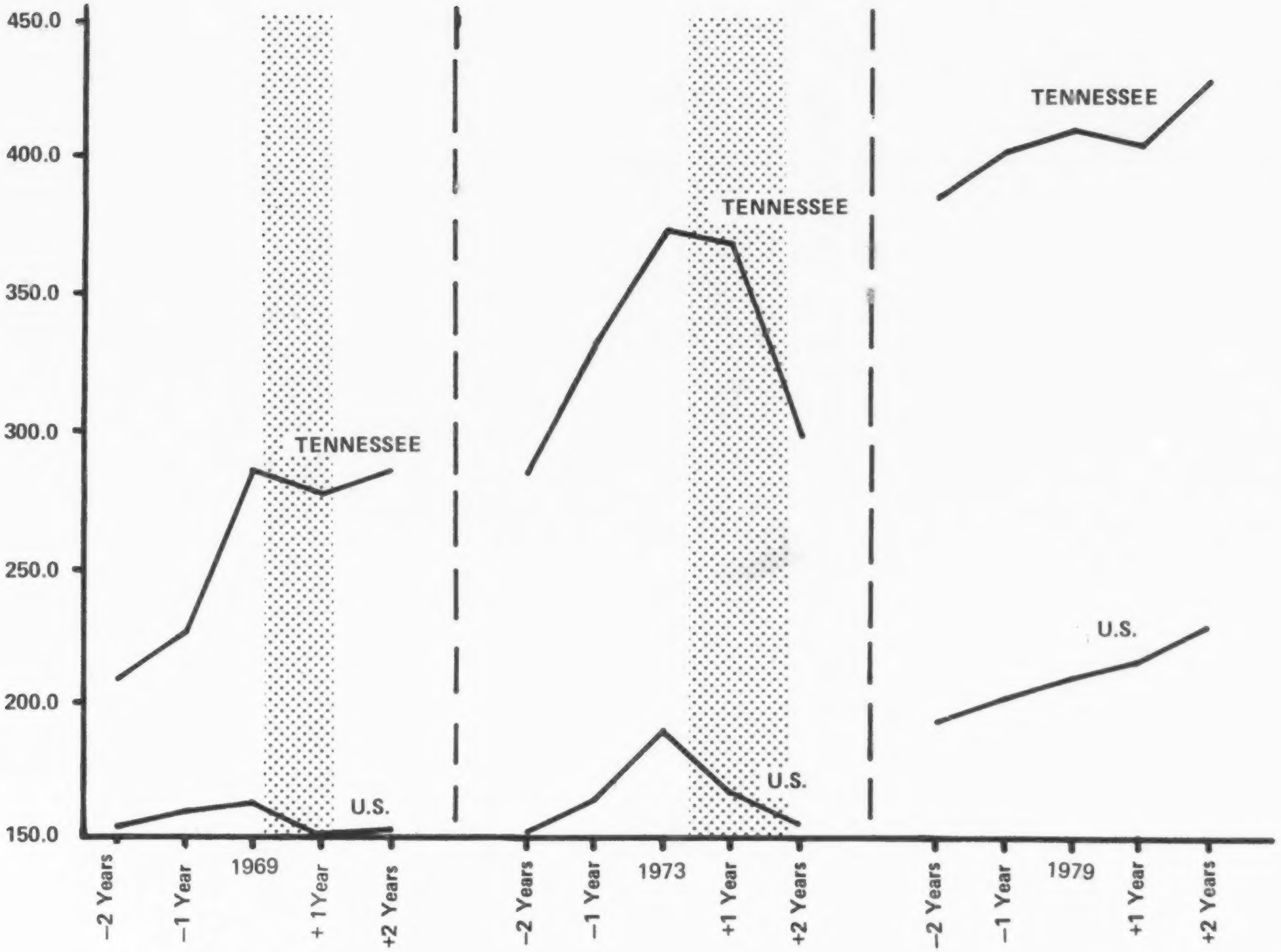
(Percent)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 14

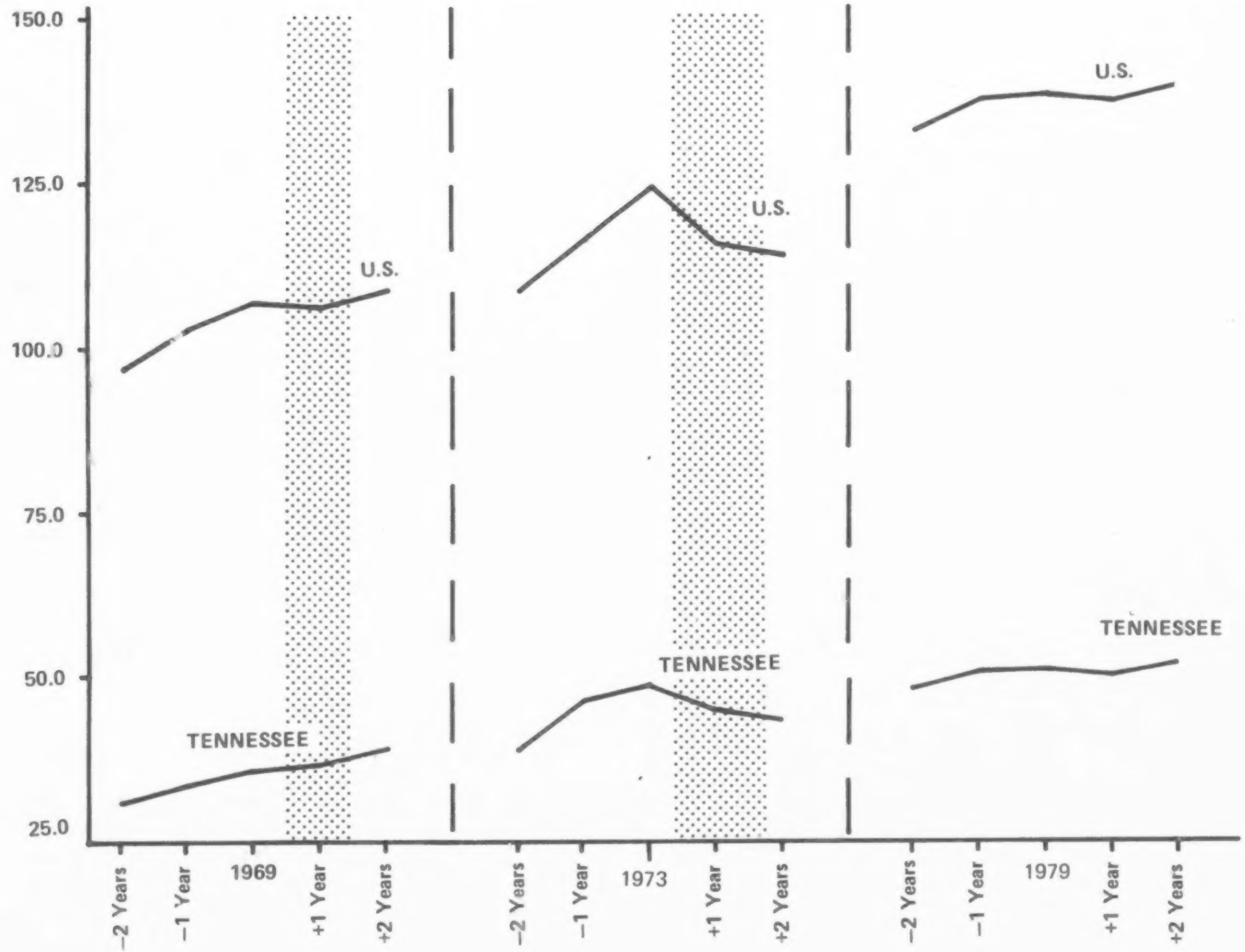
RELATION OF TENNESSEE DURABLE GOODS OUTPUT (in 1972 Dollars) TO U.S.
(Tennessee, Ten Millions; U.S., Billions)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 15

RELATION OF TENNESSEE NONDURABLE GOODS OUTPUT (in 1972 Dollars) TO U.S.
(Tennessee, Hundred-Millions; U.S., Billions)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

CHAPTER 3

THE OUTLOOK FOR SPECIFIC INDUSTRY GROUPS IN THE TENNESSEE ECONOMY

This chapter contains synoptic reviews of the detailed sectoral reports which are presented fully in Volume 2. The most crucial data and analysis relevant to each sector are summarized here to provide a single, short document which is quickly digestable. Materials presented in this chapter are organized for each of the following industry groups:

- manufacturing
- energy
- finance, insurance, and real estate
- transportation, communications, and public utilities
- trade and services
- agriculture
- state and local government

Manufacturing

Manufacturing currently accounts for 35 percent of the State's real output. This amount has remained relatively constant since 1969. This has occurred despite a fall in the relative numbers of manufacturing jobs which have declined from 35 percent in 1969 to 30 percent in 1979. Manufacturing represents a sector which has provided an increasing source of output dollars despite its decreasing labor input. Compared nationally, the Tennessee proportion of labor employed in manufacturing is greater than the national share in manufacturing. As a result, manufacturing occupies a central, key role in the Tennessee economy.

At the same time, within Tennessee manufacturing there has been a relative shift from nondurables to durables. Durable goods manufacturing employment as a percent of total manufacturing has moved from 42 percent to 45 percent in the span of 1969-1979. While this is consistent with an increase in labor efficiency noted above, it represents a growing sensitivity to economic fluctuations. This arises because durable goods production has been historically more sensitive to the business cycle than has nondurable goods production. On the basis of these facts, central concern in a year of anticipated downturn should be focused on manufacturing. A short-run analysis of the industry provides this view.

Short-run analysis of the State's manufacturing sector indicates that Tennessee's experience with business cycles has generally been slower to decline during periods of national downturn and faster to increase during periods of upswing. However, the evidence has not been perfectly consistent. In the recession of 1969-1970, while the U.S. lost 4.0 percent of its manufacturing employment, Tennessee lost only 1.1 percent. In the upswings of 1971-73 and 1975-78, while the U.S. was gaining 8.2 percent and 11.0 percent, respectively, Tennessee out-gained the U.S. with growth rates of 12.8 percent and 13.8 percent, respectively. In the 1973-75 downturn, however, the U.S. lost only 9.1 percent of its manufacturing employment, while Tennessee declined by 11.6 percent.

The Tennessee Econometric Model has computed the reasons for this (possibly) growing susceptibility to the cyclical downturn in terms of relative cost positions of the State's manufacturing output.

These have been measured by such variables as relative taxes, wages, and energy costs among others. The current forecast reflects such factors in "passing" the national downturn through to Tennessee.

The short-term forecast, considering these factors, suggests that Tennessee growth (decline) in most cases of manufacturing industry is in excess (less than) of that for the nation. Employment is expected to decline, generally, but much less rapidly than in 1973-75. The forecast anticipates a loss of 10,000 jobs during 1978-1980 in durable goods, relative to 1,600 jobs in nondurables. However, compared to 1973-75, the loss of 10,000 jobs is small relative to the earlier durable goods loss of 36,800 jobs. Similarly, the current anticipation of 1,600 fewer jobs in nondurables is significantly smaller than the 23,600 jobs lost in 1973-75.

Within the durable goods sector, it is expected that the hardest hit will be fabricated metals producers, followed in order by nonelectrical machinery, furniture and fixtures, electrical machinery, and finally, transportation equipment. Within nondurables, apparel is expected to increase its employment. So also, by a small margin, employment in the paper industry and the other nondurable goods industries is expected to increase. The remaining nondurable industries will likely decline. The most severe of the reductions in the labor force will be textiles, losing 2,200 jobs and then followed by smaller declines in food, chemicals, and rubber products.

Long-run analysis of the State's manufacturing sector suggests that 74,300 new jobs will be added to the projected low in 1980 by 1988. This rate is only slightly slower than the historical periods of increase--71,700 jobs in the interval from 1960 to 1965, 77,300 jobs in 1965-1970, and 63,300 jobs in 1975-78.

Durable goods are projected to continue their increase relative to nondurables. From 1979 through 1988, durable goods employment is forecast to grow by 19 percent. This is more than double the growth in nondurables over the same period (8 percent). These growth rates are, nonetheless, slightly misleading because of the larger current size of the nondurables work force. Absolute levels of employment are projected to grow by about 44,500 in durables and by 23,000 in nondurables.

Energy

In Tennessee, as in the nation, energy remains a question with uncertain answers, as the recent OPEC embargo and the Iranian crisis have demonstrated. Before 1970, energy was considered abundant, and its relative price was low and declining; but then the nation's domestic production of natural gas and oil peaked and subsequently began to decline. Coupling this problem with sizable international oil price increases has intensified energy supply problems in the domestic markets of the United States. Many of the uncertainties of the energy question are as political as they are economic, and this element has increased the difficulty of making energy price and consumption forecasts.

Tennessee energy forecasts are based on a set of national forecasts which assume the following: after announced December 1979 increases in foreign oil prices, no major additional international shocks are anticipated; prices of domestic oil and natural gas prices will be decontrolled by 1982 and 1985, respectively; Mexican natural gas imports will start in 1981; and the flow through the Alaskan pipeline will increase to 2.0 million barrels per day by 1981. Using these assumptions, national projections forecast the proportion of U.S. energy coming from nuclear and coal to rise and the proportion coming from oil and natural gas to decline.

Over the next decade, trends show a substantial slowdown in the consumption of energy and a continuing increase in relative energy prices. The anticipated slowdown in the growth of gross state product in 1980, along with projected hikes in international energy prices, should keep energy consumption in BTU's virtually stable from 1979 to 1981. Among the sources of energy consumption, electricity displays the quickest rate of growth, increasing approximately 2.5 percent per year on average, more rapidly in residential use and less rapidly in industrial use. Total natural gas and gasoline consumption are not expected to change over this period. Both coal and fuel oil display some growth, although the growth rate is limited when compared to their recent rapid rates of increases. After 1981 the rates of growth in consumption of each of the energy sources except for natural gas quicken to keep pace with the State's rate of general growth and to adjust to less unfavorable changes in relative energy prices. Total electricity consumption will display the highest long-run rate of growth at about 3.5 percent. Over this period, however, the industrial subsector will grow the quickest, and the commercial subsector, the slowest. Although industrial natural gas consumption may grow slightly, it will be offset by declines in the residential and commercial sectors, so that total natural gas consumption displays essentially no growth in the 1982-to-1988 years. The coal, gasoline, and fuel oil sectors should continue to display weak (but positive) growth in consumption during these years.

Over the 1979-to-1981 years gasoline and fuel oil prices are projected to grow the highest at 61 and 45 percent, respectively. The remaining energy prices are expected to grow about 50 percent faster than the price deflator of gross state product. After 1981, the growth rates of prices in each of the energy sectors, except for natural gas, are expected to slow. They will grow only about 30 percent more rapidly than the gross state product price deflator. Natural gas prices continue to grow 50 percent faster than the output deflator as they are decontrolled and allowed to reach market-determined levels.

An important issue in the energy debate is the relationship between energy and economic growth. Analysts in the last several decades concluded that the energy-to-output ratio is a constant. As a corollary, therefore, they would also conclude that when the growth rate of energy utilization is reduced (for energy conservation), the growth rate of output will decline proportionately. Many analysts continue to believe this relationship holds, but over the forecast years, the Tennessee Econometric Model projects that the State's energy-to-output ratio will decline in response to the higher energy prices and supply limitations. In short, considerable efficiencies can be obtained in the use of energy by the State's firms and households without a concomitant reduction in the State's rate of economic growth.

Finally, although a national energy policy remains to be formulated, movement toward a national plan does not imply that a state government cannot influence the level of energy consumption within its boundaries. In California, for example, the state has enacted various incentives ranging from tax credits to building code revisions that stress the use of solar energy. Such policies have helped make California the most "solarized" state in the nation.

The forecasts indicate that Tennessee's economic growth is compatible with lower levels of energy consumption. If the State were to adopt policies similar to those of California, the Tennessee State government could play a guiding role in reducing its economy's energy intensiveness. Policies that stress conservation, such as tax credits, could also be developed. A program such as an energy extension service would be a useful means of informing the public about the possible conservation measures. Conservation investments might also be spurred by State loan guarantees.

Finance, Insurance, and Real Estate

The Tennessee Econometric Model forecasts output, employment and wages for the Finance, Insurance, and Real Estate (FIRE) industries as one sector. The Model, however, breaks other relevant variables in the sector forecast into component parts, providing separate forecasts of the aggregate commercial bank balance sheet, the aggregate savings and loan balance sheet, income, compensation within the financial industry, and employment in the construction industry.

The FIRE sector is likely to behave substantially differently during the current recessionary trend than during the most recent recession of 1973-75. Growth in the sector during 1980 will be equal to the average State growth, but in 1981 growth in the sector will lag Tennessee growth. In real terms the FIRE sector will decline slightly in 1980 and will grow but at slower rates than the aggregate of other sectors during 1981. The sector appears to be better insulated from the downturn than it was in the previous recession.

Employment growth has been stronger in this sector than for the State economy during 1979. While falling to the State average during 1980, it will regain its stronger growth again in 1981. This pattern is somewhat unlike the previous recession when employment growth in the FIRE industries was weaker, declining slower than average in the downturn and increasing slower than average in the upturn. Wages across the sector will be reduced more than the state average during the downturn, but they will rebound in 1981, with slightly more strength than the general economy.

In sum, the next two years are expected to be a period of slow growth and disappointing earnings for the firms in these industries. Sector activity is likely to be below that of the State economy with high interest rates being an important contributor to the poor showing.

Long-term growth in the sector's output is forecast to be slower in both real and nominal terms than growth in the general State economy. This results even though employment is expected to keep pace with State employment growth. This slower growth in output is therefore coincident with lagging growth in value added per worker in FIRE. The latter is noticeably below the State average. Finally, the real value of average wage compensation will grow slightly faster for the FIRE sector than for the State.

Finance. Low profitability in the finance industries may result over the next two years because interest rates are now high and are expected to remain relatively high. Resources available to firms in the industry are likely to be restricted as deposits grow in a sluggish fashion. Loan demand is also likely to be low as consumers postpone the purchase of some durable goods, such as automobiles. The combination of these factors may lead to a slight increase in the loan-to-deposit ratio as firms seek to offset the high cost of funds. Nonetheless, profitability is likely to be low.

Long-term trends in the finance industry appear more favorable. Strong deposit growth is anticipated so loanable funds should be available. Loan demand is expected to grow faster than deposits as healthy manufacturing producers and durable goods consumers create a demand for funds. The loan-to-deposit ratio will rise over the next decade as the loan demand grows faster than deposits. With declining interest rates, the profitability picture in the finance industry should be strong.

Insurance. The life insurance industry is relatively immune to short-term fluctuations, so this industry will provide relative stability to the rest of the Tennessee economy over the next two years. The stability results because business downturn will produce no significant changes in rates of policy renewals and these provide a major portion of income for insurance companies. In fact, about 80 percent of premium income is provided from this relatively stable source. Sales increases along with high investment incomes (from high interest rates) hold up the remainder of the industry's income. Robust sales in post-recession 1981 should further stimulate income as the economy moves beyond the short-run forecast.

Long-term prospects for the life insurance industry appear favorable as the result of several trends. Annuity premiums, which are expected to grow faster than total premiums over the next decade, are one reason. Inflation, real economic growth, and increased attractiveness to investors are other causes of this rapid growth in premiums. Tennessee's growth in premium volume has outstripped the nation over past years. This pattern can be expected to continue and real increases in premiums are anticipated in Tennessee over the long term.

The property and liability (P&L) insurance industry in Tennessee closely follows national trends. Nationally, net income in 1979 will reach record levels, though the income growth rate has declined. This decline in income can be expected to continue as the P&L industry is more affected by economic cycles than the life insurance industry. The current recession will be less severe on the P&L business than the most recent 1973 recession, but no nominal income growth is expected for 1980. Income will grow moderately in 1981, declining in real terms. Real growth in premiums will likely be negative during 1980 but will show some real gains in 1981.

Real Estate. Demographic trends, interest rates, availability of mortgage funds, and consumer expectations are key determinants of the demand for housing. The demand for housing will show moderate real growth over the 1980's and should signal a steady demand for new housing. Nevertheless, variations across the state are expected to result in uneven growth as changes in population and income are distributed unequally.

The sudden increase in interest rates has discouraged housing starts over the past six months. If high rates continue during 1980 with strong expectations that they will fall thereafter, housing demand will remain weak. However, as rates moderate or if people anticipate rates will remain high for an extended period, demand will increase. The forecast suggests that demand will begin to pick up under these circumstances by the third quarter of 1980. Pent-up demand (because of current high interest rates) will further lead to significant demand increases in late 1980 and in 1981. Availability of mortgage funds is, of course, a necessary ingredient in these housing purchase transactions. High cost mortgage funds are anticipated to remain available in Tennessee, though they may be less available than in recent years.

Interest rates, availability of mortgage funds, and even consumer expectations are heavily dependent on activities of the federal government and Federal Reserve. Thus, forecasts in the real estate sector are difficult because assumptions must be made on how these agencies will behave. The recent Federal Reserve Board policies provide hope for the industry with steady real estate activity over the 1980's. In the short-run, weak demand through the second quarter of 1980, with strengthening of demand in the second half of 1980 and 1981, seems most likely.

Transportation, Communications, and Public Utilities

Although a variety of different industries comprise the transportation, communications, and public utilities sector (TCPU), the major economic characteristic that holds this sector together is that each of its industries is subject to some form of government regulation. These regulations control the entry into and exit of individual firms from the industry. They determine the level and types of rates a firm can charge. Moreover, except for the transportation segment of this sector, price changes in each of the industries usually has little short-run influence on demands for industry output. Finally, many of the outputs produced within this sector display little variability over the business cycle. Water, as an example, is consumed in relatively constant proportions in both recessionary and inflationary periods. These characteristics stabilized this sector's year-to-year growth, making it, in general, easy to forecast. Support for this conclusion can be developed by comparing the business cycle patterns of this sector in Tennessee and total gross state output from 1969 to 1978. In general, TCPU output displayed less of a business cycle than did gross state product over this period.

The 1972 dollar value of TCPU output is forecast to grow slowly in both 1980 and 1981. Although the state moves into a serious downturn in 1980, TCPU's growth rate in output falls only slightly relative to its 1979 level. In addition, as the State's economy rebounds strongly in 1981, TCPU's output increases very little. Wages and salaries in TCPU continue to grow more rapidly than the average increases for all of Tennessee's employees. This is a reflection of the greater unionization of this sector relative to other sectors. Although TCPU's employment growth is projected to slow relative to 1979 in both 1980 and 1981, it remains slightly positive. In addition, the same general relationship holds between this sector's employment and overall employment as for TCPU's output and gross state product in these years.

After 1981, TCPU's output in 1972 dollars is forecast to grow moderately (at about 2 percent per year on average), which is only about two-thirds as rapid as the growth in gross state product. As the rate of inflation slows in 1982 and 1983, the increase in this sector's wages and salaries also slows. After 1983, its wages and salaries are forecast to grow somewhat faster than the average for all Tennessee industries. Given the slow growth in TCPU's output and the rapid increase in its wages and salaries, a consistent finding is that employment grows very slowly through 1988.

In general, this forecast indicates a period of slow but constant growth for the transportation, communications, and public utilities sector over the 1980 to 1988 years. The decline in real output that is expected in 1980 for the state will have little influence on this sector.

Over the next decade many changes will occur in the TCPU sector, some of which are already underway. Federal deregulation started in the airline industry and is expected to continue and spread to other regulated industries. Trucking is likely to be the next industry to be deregulated. In general, the airline deregulation has been beneficial since it has smoothed the scheduled supply of air service among areas and has decreased prices. Similar benefits can be expected when trucking and other regulated industries are deregulated.

Many changes will also occur at the area's major utility. TVA is currently exploring alternative electrical rate structures that promote conservation in the use of electricity. The impacts of these alternative rate structures on the State's industries and households have yet to be determined. If it is found that the alternative rate structures will have adverse effects, policies can be developed that will soften their impacts on the State's firms and households. In addition, it now appears that TVA will bring several nuclear power plants on line in the next decade. The State will likely become involved in assuring that these plants can be operated within reasonably safe limits.

Currently Tennessee is one of the few states that has yet to adopt the 80,000 pound load limit for trucks recommended by the federal government. Most of the states that surround Tennessee have adopted this limit. If Tennessee chooses not to adopt this limit, trucks will either avoid the state or move through "underloaded." Further evaluation of the impact of this result should be undertaken.

Similar issues abound in the legalization of "double bottom" trailers, which have been permitted in many surrounding states.

Trade and Services

Nationally, it now appears that no real growth will occur in retail sales in 1979. This is a leading indication that the national economy is approaching a recession. The major reason that retail sales have been able to match even 1978 sales is consumers' willingness to spend out of savings. The current national savings-to-income ratio is only 4.1 percent, which is lower than the average of 6 percent and is considerably lower than the 10 percent ratio that existed at the trough of the last recession. If the savings/income ratio were to return to a level as high as 7 percent, consumer spending would be reduced nationally by $45 billion. The low saving ratio is probably a reflection of consumers' willingness to spend today before inflation eats up their budget. Noted in Chapter 1, this is, in fact, an effect of the inflationary psychology which the Fed is trying to eliminate. The persistence of such high consumption during the move into the downturn is one of the factors on which the forecast of adopting the "Volcker-prong 2 policy," continued high interest rates as put forth in Chapter 2, page 25, is based. With the predicted movement of the economy into a more serious downturn next year, however, consumers will reduce spending as the unemployment rate increases. This will intensify the recession further but is the signal needed nationally to stem the inflationary hold on the economy. Under this situation, national retailers justifiably were concerned about Christmas and continue to be concerned about 1980 sales.

Tennessee's real retail sales are projected to decline slightly in 1979. It is a slowdown in the State automotive sales that accounts for this year's negative growth in retail sales since nonautomotive sales display slight growth. It appears that the slowdown in the State's growth and, possibly, uncertainties about gasoline supplies have made Tennesseans unwilling to make the "large ticket" automobile purchases.

Retail sales in real terms are projected to decline by about 1 percent in 1980 with the culprit once again being a decline in automotive sales. In addition, real nonautomotive sales also decline slightly. As the State's overall level of economic activity quickens in 1981, real retail sales quicken substantially as automobile sales rebound. Retail sales growth in 1981 is faster than in 1978, which was a good year for retailers. Nevertheless, from the end of 1978 to 1981, little overall growth is projected for the retail trade sector, indicating that these years will be incredibly slow-growth years for the industry.

In addition, nominal retail sales growth in 1979 and 1980 is expected to be less than nominal growth in disposable income. This reflects a trend that has been evident in national data for some time but, until this forecast, was not visible in the Tennessee data. This trend suggests that retail sales are becoming relatively less important in total income due to inflation and a shift into service-type consumption.

Throughout the remainder of the forecast period, real retail sales are projected to grow moderately at around 3 percent per year, with automobile sales growing slightly faster and nonautomobile sales growing slightly slower than total sales. Since gasoline consumption is forecast to grow slowly, the growth in the automobile stock indicated above implies that it must be more fuel efficient. Home furnishings and appliances will probably be one of the quickest growing of the nonautomotive retail sectors as a large number of "baby boom" families set up new households.

Trade employment grows only about 50 percent as rapidly as Tennessee total employment from 1980 to 1984. After 1984, however, trade employment is projected to grow less rapidly than overall employment. Throughout the forecast years, wages and salaries are expected to grow less rapidly in the trade sector than for all Tennessee employees.

Real service output grows slowly at 1 percent in 1980 as the State's economy slips into the downturn but then quickens to 2.7 percent in 1981 as the economy expands once again. Employment in the service sector continues to expand at about 2.6 percent on average in these years.

Although the forecast for real service output in 1980 and 1981 is lackluster, the longer term forecast through 1988 is for steady growth at a rate slightly less than the rate displayed by the overall economy. In addition, moderate growth is expected in service employment at about 2.25 percent per year from 1982 to 1988.

Over the next decade, a number of economic and demographic trends will influence how families spend their incomes. Inflation will be a major factor. As inflation continues over the next decade, not only will the general rate of inflation be important but also the rates of inflation within individual consumption sectors. For example, the rate of inflation in durable goods has been less than the rate on service-type goods. This should cause consumers to shift to goods whose prices have displayed little relative growth. Taxes are also influenced by inflation. As incomes rise due to inflation, taxes tend to increase due to the progressive nature of the federal tax system. Not only must a family's income rise to match inflation, but it must also increase to offset the additional taxes that must be paid if a family's purchasing power is to remain constant.

Demographically, as the "baby boom" population cohort "ages," the number of new households will continue to grow faster than total population. Therefore, the demand for homes and furnishings should continue strong well into the 1980's. In addition, this group will be better educated and will probably have higher disposable incomes. Unless rising energy costs completely capture this additional income, the "baby boom" cohort should make good consumers during the 1980's.

Agriculture

Performance in the agriculture sector is affected by factors which influence the demand and supply for specific farm commodities. On the demand side two important factors are the general economic slowdown of 1980 and the partially compensating export market.

The economic slowdown will result in a decline in per capita disposable income. Dollar expenditures on food and beverages may not increase enough to offset expected price increases during the slowdown so per capita food consumption may fall. However, the experience will be mixed with some agricultural products affected more than others. Many of the food products will experience little demand fluctuation because they are price inelastic. Demand for some products--retail meats, expensive food items, convenience products, meals away from home--among others, is likely to decline.

High export demand will buoy the overall demand for agricultural products and prevent fluctuations in agricultural prices that might have occurred otherwise as a result of good crop yields and relatively low domestic demand. The agriculture sector yields a significant positive net trade balance during fiscal year 1979. This should continue during 1980 as crop yields overseas have been poor, generally.

On the supply side, agriculture is likely to experience large input price increases. The main concern again this year is with uncertainty regarding supplies and prices of petroleum products. The short-term outlook for petroleum products, analyzed above, is for continued tightness of supply and significant real price increases of 8 percent per annum. Although electric prices will also increase, the anticipated change is less than for petroleum. Modern American agriculture has developed on the basis of cheap energy and substantial yield effects will result from restricted energy supplies or appreciably higher energy prices. The federal government can be expected to intervene to ameliorate energy shortages in critical areas at least over the short term. Current federal regulations give the agriculture sector high priorities for receiving natural gas and petroleum.

Other input prices are also likely to rise over the short term. Price increases, perhaps slightly lower than the CPI increases, are anticipated for pesticides. Significant real price increases can be expected for fertilizers.

Farm machinery prices may also rise as a result of higher production costs. However, high interest rates may lower demand, leaving price somewhat lower to those who can afford financing. The net effect probably decreases the demand for machinery and to the extent that farm incomes fall, demand for machinery will be further discouraged.

Over the long term the agriculture sector may provide some relief against rising costs from higher petroleum prices. Replacement of commercial fertilizers (many using petroleum as an input) with organic wastes is one option in maintaining crop yields while reducing petroleum use. The use of new and existing crops and residues as new energy sources is another small-scale energy option open to farmers. Research and development programs to facilitate these options now appear to be given high priority by research being conducted by the U.S. Department of Energy and private industry.

The short-term economic forecast for Tennessee calls for substantial increases in cash receipts from farm marketings of all crops during 1980 and 1981. The most important products, in order, will be soybeans, tobacco, cotton, corn, and greenhouse and nursery products. Cash receipts from other agricultural products will also increase over the next two years, though less than for crops. Receipts from dairy products will grow fastest, followed by poultry and eggs and then meat animals.

Value added from agriculture will grow during 1980 as overall gross state product declines slightly. In 1981, the state economy will rebound with more strength than the agriculture sector. Over the full span of years, gross state product will grow faster from 1979 to 1981 than will the agriculture sector.

Agricultural employment is expected to decline during 1980 and then rebound slightly during 1981. A small decrease in total agricultural employment is forecast for 1979-1981.

Over the 1980's, growth in value added for Tennessee agriculture is expected to be lower than for gross state product. Therefore, agriculture will decline as a percentage of gross state product over the decade. Nonetheless, there will be some real increase. Employment in agriculture is also expected to grow noticeably slower than nonagricultural employment. Both results continue the long-term trends that have characterized U.S. agriculture as a composite industry.

Growth in cash receipts will be uneven. Meat animals are likely to exhibit the most rapid growth in the decade, followed by poultry and eggs. Crops and dairy products will show lower than average cash receipts growth during the 1980's.

State and Local Government

In real terms, the resources of the public sector will grow only marginally over the next two years unless new revenue sources are exploited. The Tennessee State government will experience a decline in tax revenues when these are corrected for inflation. Real local government tax revenues are in a position, on the contrary, in which they must grow, probably through tax rate changes. This is because local governments provide selected services whose demands do not fluctuate much with recession or inflation. As their costs rise in pace with the remainder of the economy, these governments cannot cut back on services. Consequently, they are likely to be forced to raise tax revenues to meet service demands. In contrast, greater budget flexibility permits the State to avoid similar tax increases by making carefully designed cutbacks in expenditures.

State tax revenues will grow at a slow nominal rate during fiscal years 1980 and 1981. The slow tax growth will result from the slowdown in growth of gross state product and the concurrent tendency for tax elasticities to decline during a recession. Growth in real local tax revenues will offset decline in state revenues leading to a small real increase for the total of the two over the next two years.

The Tennessee tax structure causes the decline in tax elasticities during a recession. One reason for this decline is that durable goods purchases are postponed, decreasing potential sales tax revenues. Since revenues from selective sales taxes are not responsive to price changes, the absence of growth in physical quantities of consumption makes revenues fall behind nominal income growth. Tax systems more closely aligned to income suffer less from this problem of declining elasticities than does the Tennessee system.

Following the national recession, durable goods sales will pick up and the tax elasticity will again increase. Combined with the post-recession boost in gross state product, the higher tax elasticity will mean relatively rapid growth in tax revenues. Thus by fiscal year 1982, state tax revenues should grow more rapidly.

Over the 1980's, Tennessee State tax revenues will still increase slower than gross state product unless the tax structure is altered. In all likelihood, costs of providing services will at least keep pace with the growth in tax revenues. Therefore, no increase in per capita service levels from state funds can be expected over the decade. Consequently, the trend in federal intergovernmental revenues is important in determining the total per capita services available. A substantial real decline in these revenues could leave both State and local governments financially strapped.

Real State and local government expenditures will grow over the next two years. Local governments, with greater resources available, will exhibit the greatest growth in expenditures. State and local government expenditures, as a percent of gross state product, are expected to remain relatively constant over this time period.

During the 1980's, no growth in the expenditure share of gross state product is anticipated. Any changes in expenditure patterns are likely to be reflected in the mix of expenditures rather than the overall availability of service levels. Demographic changes, for example, may indicate declining education expenditures and rising health, particularly medicaid, costs.

State and local government sector wages have grown less rapidly in the past decade than wages and salaries for all industries and for federal civilian employees. This decline is explained by trends in public funds. These funds have faltered in times of economic stagnation or downturn and they have not recovered when economic activity has increased. The current recession should continue this trend, making real wages decline. However, failure of average annual state and local employee wages and salaries to keep pace with private industry wages and salaries has serious implications. Governments seeking to employ and retain competent employees may not be able to do so.

Average State-local government employment is expected to grow at a slower pace during the 1980's compared with previous decades. Growth rates in employment have tended to be above average in recessionary periods of the 1970's and this short-term tendency is expected to continue even though to some lesser extent in the current economic slowdown. State and local employment growth should exceed 2 percent through 1981 and then remain below that level for the next half-decade.

2/15/80

S7560-4.2

An Economic Report to the Governor of the State of Tennessee

On the State's Economic Outlook

Volume 2

January 1980

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. TN-STAE-80	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle ECONOMIC REPORT TO THE GOVERNOR OF THE STATE OF TENNESSEE ON THE STATE'S ECONOMIC OUTLOOK Volume 2		5. Report Date January 1980 6. Performing Organization Code
7. Author(s)		8. Performing Organization Rept. No.
9. Performing Organization Name and Address Tennessee State Planning Office 660 Capitol Hill Building Nashville, TN 37219		10. Project/Task/Work Unit No. 11. Contract Grant No.
12. Sponsoring Agency Name and Address Economic Development Administration U.S. Department of Commerce Washington, D. C. 20230		13. Type of Report & Period Covered Final 14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstracts

A forecast of the economic conditions within the State of Tennessee is presented. It focuses on the way in which national economic health and national and international policy are likely to influence the State. Material is presented to compare the short-run forecast to recent periods of national recession. The long-run forecast provides data for the years 1980 through 1988.

17. Key Words National and State Economic Conditions Forecast of the years 1980 through 1988	18. Distribution Statement

19. Security Classif. (of this report) UNCLASSIFIED	20. Security Classif. (of this page) UNCLASSIFIED	21. No. of Pages	22. Price

AN ECONOMIC REPORT TO THE GOVERNOR OF THE STATE OF TENNESSEE

On the State's Economic Outlook

Volume 2

Prepared by

CENTER FOR BUSINESS AND ECONOMIC RESEARCH
COLLEGE OF BUSINESS ADMINISTRATION
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Editors:

Stephen P. Coelen, Project Director and Director, Tennessee Econometric Model
William F. Fox, Associate Director, Tennessee Econometric Model
Glen E. Schuler, Jr., Associate Director, Tennessee Econometric Model

In Cooperation With

THE TENNESSEE STATE PLANNING OFFICE

Published By

The Tennessee State Planning Office
Nashville, Tennessee

January 1980

The preparation of this report was financed in part through the Tennessee State Planning Office and EDA Planning Grant 04–25–01355–02.

CONTRIBUTORS TO THE REPORT

AUTHORS

OVERVIEW

Stephen P. Coelen, Associate Professor of Economics

MANUFACTURING

Charles B. Garrison, Professor of Economics

ENERGY

John R. Moore, Associate Dean and Professor, Department of Economics

Glen E. Schuler, Jr., Assistant Professor of Economics

FINANCE, INSURANCE, AND REAL ESTATE

Richard M. Duvall, Head and Professor, Department of Finance

Albert L. Auxier, Associate Professor of Finance

H. Stan Banton, Assistant Professor of Finance

TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES

Frank L. Hendrix, Professor of Transportation

TRADE AND SERVICES

James R. McMillan, Associate Professor of Marketing

AGRICULTURE

Irving Dubov, Professor of Agricultural Economics

STATE AND LOCAL GOVERNMENT

Kenneth E. Quindry, Research Professor, Center for Business and Economic Research

William F. Fox, Assistant Professor of Finance

SUPPORTING CBER STAFF

Patricia Price, Research Associate

Susan Bott, Graduate Research Assistant

Stephanie Fitzgerald, Managing Editor

Jeanne McDonald, Publications Coordinator

Susannah Prescott, Editorial Assistant

Patricia Hunley, Word Processing Group Supervisor

Denise Jones, Senior Magnetic Keyboard Specialist

Patricia Flynn, Magnetic Keyboard Specialist

Brenda Henderson, Magnetic Keyboard Specialist

Fritz Rudolph, Graphic Artist

FOREWORD

An Economic Report to the Governor of the State of Tennessee for 1980 is presented in two volumes. Together they provide a comprehensive and unified evaluation of the most likely future economic environment for the nation and the State. Exceptional uncertainty, particularly at the national and international levels, draws attention to the assumptions which underlie these economic forecasts. These critical assumptions are stated in the Introduction contained in both Volume 1 and Volume 2.

Generally speaking, Volume 1 presents the overview forecast and summary sectoral analysis of both short-term (to 1981) and long-term (to 1988) forecasts. Special emphasis in Volume 1 is placed on brevity in review of potential consequences of the comprehensive forecast for the State of Tennessee. Volume 2 contains detailed evaluation of each of the major sectors of the economy accompanied by extensive tabular data in the text, plus complete statistical appendixes covering each year of the forecast period, to 1988, as well as statistical economic history, from 1969 to the present.

The report is the result of professional judgment of professors at The University of Tennessee, Knoxville, all authorities in specific areas of economic activity. Their forecasts were developed in interaction with the overall forecast, using the Tennessee Econometric Model.

Many other people, too numerous to mention specifically, have contributed to the contents of this report. The research staff extends special appreciation to the Director and staff of the Tennessee State Planning Office.

Stephen P. Coelen
Project Director

David A. Hake, Director
Center for Business and
Economic Research

TABLE OF CONTENTS

Volume 1

Chapter Page

Foreword v

1 Introduction 1

2 The Outlook for the Tennessee Economy 5
  Introduction 5
  Significant Features of the Tennessee Forecast 7
  The National Outlook 14
  The National Climate for Economic Growth . . . 19
  Monetary Policy 20
  U.S. and OPEC Energy Policies 26
  Fiscal Policy 29
  The 1980 State Downturn--How Serious? 30

3 The Outlook for Specific Industry Groups in the Tennessee Economy 41
  Manufacturing 41
  Energy 44
  Finance, Insurance, and Real Estate 47
  Transportation, Communications, and Public Utilities 51
  Trade and Services 54
  Agriculture 58
  State and Local Government 61

Volume 2

Foreword v

1 Introduction 1

2 Manufacturing 5
  Introduction 5
  Cyclical Responsiveness of Tennessee Manufacturing 5
  Short-Term Forecast 11
  Long-Term Forecast 16
  The Importance of Policy 24

3 Energy 25
  Sector Response in Historical Perspective . . . 25
  National Outlook 28
  Short-Term Forecast 30
  Long-Term Forecast 34
  A Short Note on Policy Perspectives 41

TABLE OF CONTENTS

Volume 2 (Continued)

Chapter Page

4 Finance, Insurance, and Real Estate 45
  Finance and Banking 45
    The Historical Record of the FIRE Sector. . . 45
  FIRE Short-Term Forecast 48
  FIRE Long-Term Forecast 52
  FIRE Subsector: Insurance 54
    Life Insurance Short-Term Forecast 54
    Life Insurance Industry Long-Term Forecast . 59
  Property and Liability Insurance Short-Term Forecast 62
      Property and Liability Long-Term Outlook . 65
  FIRE Subsector: Real Estate 68
    Real Estate Short-Term Forecast 68
    Real Estate Long-Term Forecast 72

5 Transportation, Communications, and Public Utilities 75
    Introduction 75
    Sector Response to Economic Downturns 76
  Short-Term Forecast 82
  Long-Term Forecast 85
    State Policy Perspectives 89

6 Trade and Services 93
  Short-Term Analysis 93
  Trade Forecast through 1981 95
  Services Forecast through 1981. 101
  Long-Term Analysis 103
  Trade Forecast through 1988 108
  Services Forecast through 1988 112

7 Agriculture 115
  Short-Term Forecast 115
    Economic Slowdown 115
    Export Demand 116
    Input Costs Higher 117
    Key Item--Energy Costs 117
    Other Inputs 119
    Short-Term Projections 120
  Long-Term Forecast. 123
    Long-Term Projections 126

8 State and Local Government 129
  Short-Term Forecast 129
  Government Sector in Economic Slowdown 130
    Government Contribution to Gross State Product 137

TABLE OF CONTENTS

Volume 2 (Continued)

Chapter Page

8 Wages and Salaries 137
Public Employment 141
Long-Term Forecast 141

Appendix Tables 143
Appendix A: Tennessee Econometric Model Forecast Data (1979-1988) 145
Appendix B: Tennessee Econometric Model Historical Data (1969-1978) 167

LIST OF TABLES

Volume 1

Table		Page
1	Tennessee Selected Indicators	8

Volume 2

Table		Page
1	Growth of Manufacturing Employment in Tennessee and the United States	7
2	Sensitivity of Manufacturing Employment to Cyclical Fluctuations, Tennessee and the United States	8
3	Change in Tennessee Employment During Periods of Economic Recession and Economic Expansion: Selected Manufacturing Industries, 1973-1980	17
4	Tennessee and United States Manufacturing Jobs by Industry, 1960 and 1979	23
5	Energy Comparisons: Tennessee and the United States	26
6	Tennessee Energy Prices	32
7	Tennessee Energy Consumption	33
8	Comparisons of United States and Tennessee Total Energy Consumption and Total Energy Consumption to Real Output Ratio	35
9	Tennessee Average Annual Growth Rates of Energy Prices	37
10	Comparisons of Tennessee Average Annual Energy Consumption Growth Rates by Energy Type	39
11	Actual and Estimated Purchases of Ordinary Life Insurance in Tennessee	55
12	Estimated Direct Written Tennessee P&L Insurance Premiums	67

LIST OF TABLES

Volume 2 (Continued)

Table		Page
13	Tennessee Transportation, Communications, and Public Utilities, Selected Economic Variables, 1979-1988	83
14	Recent and Short-Term Tennessee Retail Sales. . . .	96
15	Composition of Real Personal Consumption Expenditures in the United States, 1960, 1970, and 1980	102
16	Tennessee Gross State Product by Sector, 1978-1981.	104
17	Tennessee Employment by Sector, 1978-1981	105
18	Composition of Real Personal Consumption Expenditures, 1975, 1980, and 1985	109
19	Tennessee Retail Sales, 1980, 1984, and 1988 . . .	110
20	Average Annual Percent Change in Real Growth, Trade and Services Sectors	113
21	Tennessee Agriculture Sector, Selected Economic Variables, 1978-1981.	121
22	Tennessee Agriculture Sector, Selected Economic Variables, Long-Term Forecasts	127

LIST OF FIGURES

Volume 1

Figure		Page
1	National Productivity	12
2	Quarterly GNP Economic Forecasts	15
3	Quarterly National Unemployment Rate Forecasts	16
4	Quarterly GNP Deflator Index Forecasts	17
5	Behavior of National Money Supply (M1) in Recessions	22
6	Behavior of National Prime Interest Rate in Recessions	23
7	Residential Rates for Electrical Service	28
8	Behavior of Tennessee Gross State Product in Recessions	33
9	Behavior of Tennessee Unemployment Rate in Recessions	34
10	Behavior of Tennessee Durable Goods Output in Recessions	35
11	Behavior of Tennessee Nondurable Goods Output in Recessions	36
12	Relation of Tennessee Gross State Product to U.S. Gross National Product	37
13	Relation of Tennessee Unemployment Rates to U.S.	38
14	Relation of Tennessee Durable Goods Output to U.S.	39
15	Relation of Tennessee Nondurable Goods Output to U.S.	40

Volume 2

Figure		Page
1	Tennessee Manufacturing Employment, 1960-1969	12

LIST OF FIGURES

Volume 2 (Continued)

Figure Page

2 Tennessee Manufacturing Employment, 1969-1979 and Forecast, 1980-1981 15

3 Tennessee Durables Manufacturing Employment Changes by Industry, 1979, 1980, and 1981 18

4 Tennessee Nondurables Manufacturing Employment Changes by Industry, 1979, 1980, and 1981 19

5 Tennessee Durables Manufacturing Employment Gains by Industry Forecast: 1980 to 1988 20

6 Tennessee Nondurables Manufacturing Employment Gains by Industry Forecast: 1980 to 1988 . . . 21

7 Energy Usage by Sector in BTU's, Tennessee . . . 29

8 Percent Changes in Current Dollar Gross State Product and Transportation, Communications, and Public Utilities Output 77

9 Average Annual Wage and Salary Percent Changes for All Sectors and Transportation, Communications, and Public Utilities 78

10 Current Dollar Gross State Product and Transportation Communications, and Public Utilities Output . . . 79

11 Employment Percent Changes for All Sectors and Transportation, Communications, and Public Utilities . 80

12 Disposable Personal Income and Sales 99

13 Growth Rates for Current Dollar State and Local Government Expenditures 132

14 State and Local Government Expenditures as a Percent of Gross State Product 133

15 Real State and Local Government Expenditures . . . 134

16 Growth Rates for State and Local Tax Revenues . . . 136

17 Real State and Local Government Tax Revenues . . . 138

CHAPTER 1

INTRODUCTION

An Economic Report to the Governor of the State of Tennessee embodies the annual economic forecast of the Tennessee Econometric Model. It is a Report made this year in an environment laden with uncertainty. While national forecasts have been uniformly pessimistic, other preliminary data on the third quarter of 1979 (1979.3) are contradictory, for example, showing increases in output, profits, and sales. In the beginning of the fourth quarter, on October 6, the Board of Governors of the Federal Reserve Bank announced a new policy of monetary control that does not resemble any prior policy with which the country has had experience. Further, on December 13, several members of the Organization of Petroleum Exporting Countries (OPEC) announced a 33 percent price hike on foreign oil accounting for $6 per barrel. Indications from other OPEC nations suggest further price hikes in the near future. If any single conclusion is clear, it is that the economy is in a dramatic state of unrest.

The 1980 Economic Report contains a forecast consistent with all the above factors, except the most recent oil price increases. It sorts out the diverse national data, determining what factors directly or indirectly influence Tennessee. The direct effects generally alter prices of inputs used in the production of the State's output while indirect effects influence either the competitiveness of other national firms producing similar outputs or the level of aggregate national demand. The forecast which is presented implicitly measures changes in the economic position of the State in both the short run, 1980 and 1981, during which the nation is predicted to move into and out of a recession and the long run, through 1988.

The short-run forecast calls for a 0.01 percent decline in the real value of Tennessee output in 1980 and a 3.5 percent increase in output in the 1981 rebound. The long-run forecast presents an annual average rate of growth of 2.8 percent over the next decade. Both forecasts are presented in this and the following volume.

The organization of this year's Economic Report differs somewhat from that of previous years. The Report maintains (1) the distinction between short-and long-run forecasts, (2) the sectoral approach to specific analyses on manufacturing; energy; finance, insurance, and real estate; transportation, communications, and public utilities; trade and services; agriculture; and state and local government, and (3) the presentation of historical and forecast details. Otherwise, in order to more effectively serve the different users of the Economic Report to the Governor, the material is presented in two volumes rather than one.

Volume 1 has two major overview chapters. Chapter 2 presents the general outlook for the Tennessee and the national economies. Significant features of the economy are presented, focusing on gross state output, unemployment rates, durable and nondurable goods forecasts, and other selected policy variables. The analysis contained within the chapter focuses on the likely outcome of major economic and energy policy changes, since these are deemed most important in setting the general tone of the economy. Finally, a series of figures is presented to compare and contrast the 1979, 1980, and 1981 period with earlier national downturns of 1969 and 1970, and 1973, 1974, and 1975.

Chapter 3 contains a short description of the major trends that exist within the sectors. Emphasis is placed more on the short-run forecasts in Chapter 3 than on the long-run. Finally, where it is considered to be important, the outlines of potential future policy decisions which loom as important aspects in the economic health of specific sectors are presented.

Volume 2 contains the traditional forecasts, by industrial sector, of the Tennessee economy. These are designed to carry the most detailed industrial data which are forecast. Authors who are specifically knowledgeable of each sector present analysis of the status of these sectors in Tennessee. Each chapter is divided into a short- and a long-run focus. The general organizing theme is their comparison of the short-run forecast to historical data. Wherever relevant, a section on policy is included to foreshadow what are considered to be important future issues. Finally, in the Appendix to Volume 2 there are tables containing the detailed historical and forecast data. These cover a full twenty years of data ranging from 1969 to 1988.

CHAPTER 2

MANUFACTURING

Introduction

The manufacturing sector holds a place of special importance in the Tennessee economy because it has provided much of the impetus for the State's impressive economic growth during the last two decades. While employment has declined in other basic sectors of the State's economy, such as agriculture and the extractive industries, the trend in manufacturing jobs has been strongly upward and, in fact, has been much greater than in the nation as a whole. As a result of this trend, manufacturing jobs today account for a greater share of total employment in Tennessee than in the nation, and manufacturing is the largest single sector in the State's economy.

The long-term upward trend notwithstanding, activity in manufacturing in Tennessee is subject to rather pronounced short-run fluctuations. Further, earnings in manufacturing provide a major source of spending power in the State for support of retail and service activity and thus contribute to fluctuations in these sectors. In addition to being the major source of the State's long-term economic growth, manufacturing is important to any explanation of the business cycle in the State. A forecast of State economic activity accordingly must focus on the prospects for the manufacturing sector.

Cyclical Responsiveness of Tennessee Manufacturing

Some observers periodically speculate that manufacturing will soon yield, or perhaps already has yielded, its preeminent role in the process of economic growth in Tennessee and other southern states.

It is reasoned that the rapid growth of the 1960's and the accompanying increase in the demand for labor have eroded the region's competitive advantage in labor supply. If manufacturing's relative importance were to decline, it is likely that the State and the region would become less sensitive to cyclical instability in economic activity. The experience of Tennessee in the 1970's, however, provides little support for such a view. As shown in Table 1, Tennessee's comparative advantage has persisted through the decade of the seventies in the sense that manufacturing employment has grown much more rapidly in Tennessee than in the nation as a whole. Indeed, the more cyclically sensitive durable goods component has continued to outpace nondurables and to become more important in the State's industrial structure. Thus, not only has manufacturing not yet experienced a reversal of its growth in relative importance, there appears to be considerable momentum for further gains. If anything, it is likely that Tennessee's economy will become even more sensitive to national business cycles in the future.

What is the nature of this alleged sensitivity to the business cycle? In the light of the widespread expectation that 1980 will be a year of economic downturn, this is an important question. In Table 2 is related the behavior of manufacturing employment in the U.S. and in Tennessee to the business cycles of the 1970's: the recessions of 1969-1970 and 1973-75, and the expansions of 1971-73 and 1976-78.

If one were viewing only the relatively mild recession of 1969-1970, the conclusion would be that Tennessee is able to withstand a recession much better than the nation on the average. The experience

TABLE 1

GROWTH OF MANUFACTURING EMPLOYMENT IN TENNESSEE AND THE UNITED STATES

	1969-1978	
	Thousands of Jobs	Percent Change
United States		
Manufacturing	165.0	0.8
Tennessee		
Manufacturing	52.3	11.1
Durables	39.4	19.9
Nondurables	12.9	4.7

SOURCE: Tennessee Econometric Model, Historical Data.

TABLE 2

SENSITIVITY OF MANUFACTURING EMPLOYMENT TO CYCLICAL FLUCTUATIONS, TENNESSEE AND THE UNITED STATES

	Percent Change in Manufacturing Employment	
	United States	Tennessee
Recession of 1969-1970	-4.0	-1.1
Expansion of 1971-73	8.2	12.8
Recession of 1973-75	-9.1	-11.6
Expansion of 1976-78	11.0	13.8

SOURCE: Tennessee Econometric Model, Historical Data.

of 1973-75, however, does not support such a conclusion: employment declined more sharply in Tennessee than in the U.S. The difference is that the latter recession was considerably more severe, so that even nondurables employment, which typically is less susceptible to a downswing than durables, was severely affected. (The durable goods category includes, for example, automobiles, appliances, equipment, and metals.) Tennessee in the past has been somewhat protected from recession due to its concentration in nondurables, but we learned in 1973-75 that if a recession is sufficiently severe and prolonged, nondurables employment is by no means immune. Further, Tennessee's durable goods sector has been growing more rapidly than nondurables, so that the State's economy is becoming more and more sensitive to the business cycle.

In gauging whether the downturn of 1979-1980 will be of the mild 1969-1970 type or the more severe 1973-75 type, one must try to determine whether national economic policy will be mildly restrictive, as in 1970, or severely restrictive, as in 1974. There seems to be little doubt that fiscal policy (the government's taxing and spending decisions) and monetary policy (the Federal Reserve's decisions regarding the rate of growth of the money supply) significantly influence manufacturing activity.

In the case of fiscal policy, a restrictive stance consists of increasing tax rates and/or reducing the growth of government spending. Such a stance acts to restrict private spending in the economy. On the other hand, fiscal policy is expansive if tax rates are reduced and/or the growth of government spending is accelerated. Such a stance stimulates private spending. In the case of monetary policy, a restrictive stance consists of a reduced rate of growth of the money supply. Monetary restriction tends to raise interest rates. This, in turn, inhibits private spending, especially for residential construction. An expansive monetary stance is signalled by more rapid monetary growth.

The effect of fiscal and monetary actions of recent years on Tennessee manufacturing employment may be observed by referring again to Table 2. The recession of 1969-1970 and the resulting poor performance of manufacturing was produced in part by restrictive fiscal and monetary policy (including both a tax surcharge and a reduction in the rate of growth of the money supply).

The rapid expansion of Tennessee manufacturing in 1972 and 1973 was precipitated by a tax reduction in late 1971 and an expanding money supply. As inflation became a major problem, effective tax rates were allowed to rise in 1974 and monetary policy became restrictive. The result was predictable--a sharp decline in Tennessee manufacturing in 1974 and 1975. Finally, expansive fiscal actions (including substantial tax reductions) in 1975 and 1976 and a moderately expansive monetary stance resulted in the recovery of Tennessee manufacturing employment in 1976, 1977, and 1978. (A disaggregated view of Tennessee manufacturing performance during this period is presented below.)

In summarizing the period 1969-1978, it is clear that it was characterized by stop-and-go national economic policy--alternating periods of restrictive and expansive policy actions. Manufacturing growth in Tennessee has followed a similar pattern. In fact, the Tennessee economy has now reached the stage where it is almost as sensitive to changes in national economic policy as the heavily industrialized states of the Great Lakes region.

It is instructive to compare the erratic performance of Tennessee manufacturing in the 1970's with the period of the 1960's. In Figure 1 is provided a view of the 1960's, a period during which steady growth characterized not only the national economy, but also the Tennessee manufacturing sector. While it is possible to attribute much of the steady growth of the 1960's to successful economic policy (including tax reduction in the early 1960's), the latter few years of the period obviously were influenced by the Vietnam War. The point is that national policy was expansive throughout the 1960's.

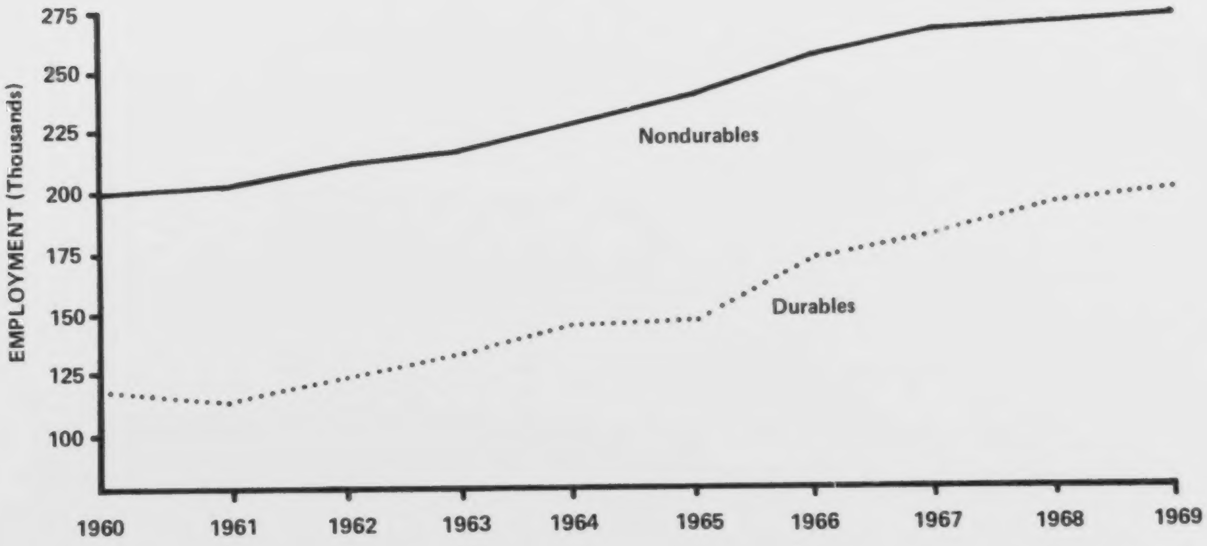
Short-Term Forecast

The short-term forecast for the Tennessee manufacturing sector is influenced by the expectation that, for the national economy, manufacturing output and employment will decline. This expectation in turn is based on the stance of monetary and fiscal policy including: (1) the recent move toward a restrictive monetary stance by the Federal Reserve and the prospect that monetary policy will remain restrictive in the near future, and (2) the move toward a tighter fiscal policy, with a major source of constraint consisting of rising effective tax rates.

Monetary policy recently has received a great deal of attention, and there is no doubt that it is presently quite restrictive. The major issue concerning present monetary policy is the likely duration of the tight market. Fiscal policy, on the other hand, has received little attention. This is surprising, for fiscal actions are at least as effective as monetary action (perhaps more so; witness the

FIGURE 1

TENNESSEE MANUFACTURING EMPLOYMENT, 1960-1969
(Steady Growth)



SOURCE: Tennessee Econometric Model, Historical Data.

vigorous expansion of 1976-78, when monetary policy was only slightly expansive but fiscal policy provided strong stimulus). And fiscal policy certainly has been recently restrictive, with the prospect that it will be even more strongly restrictive in 1980. It is perhaps understandable that this has occurred without notice, for a major contribution to a restrictiveness occurs automatically; as money incomes rise (due principally to inflation in recent quarters), effective tax rates rise as taxpayers are bumped into higher tax brackets. A second reason for the lack of awareness of fiscal restraint may be that the federal budget actually is moving toward a larger deficit, and the general impression among the public is that this constitutes stimulus. But the deficit will increase in 1980 because the economic slowdown will reduce tax collections and cause more unemployment compensation benefits to be paid out; that is, the rise in the deficit will be passive and will not reflect stimulus by the government.

The impact of the fiscal actions of State and local governments must not be ignored. It was formerly the case that revenues and expenditures of these governmental units produced an approximately balanced budget in the aggregate. This is no longer true. Throughout the nation, state and local revenues are expected to exceed expenditures by an average of $20 billion per year in 1980 and 1981. This sizable surplus reduces the disposable income of consumers and exerts a negative influence on spending for privately produced goods and services.

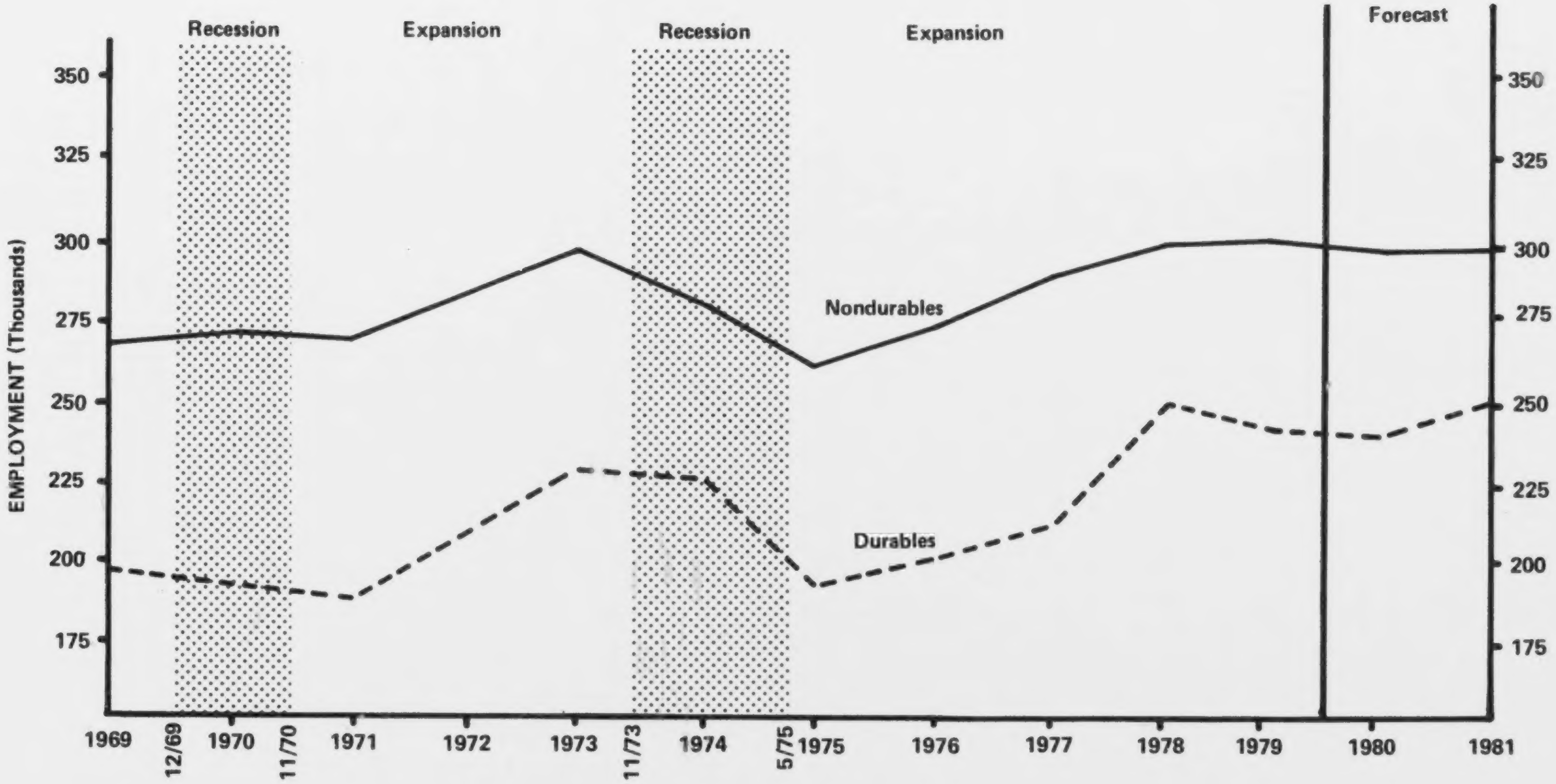
The short-term forecast, then, is influenced by a national economic policy which on balance has been restrictive in 1979, and unless its recent course is altered, will become even more restrictive in 1980. This policy already has produced a slowdown in 1979, a forecast for declines in manufacturing employment in 1980, and only gradual recovery in 1981. In Figure 2 highlights of the forecast and a comparison of the forecast period with the State's recent experience in the 1970's are provided.

It is seen that the expectation is that the downturn of 1980 will be quite mild, at least in comparison to that of 1973-75. In fact, our forecast for the combined years 1979-1980 looks a great deal like the mild recession of 1969-1970. This forecast is based on the assumption that monetary restrictions will be eased as plausible during mid- and late 1980 and that fiscal restrictions will be eased via selective tax reductions. The latter, however, will not be felt fully until 1981. If this assumption is not met (that is, if the present restrictive course is not eased), a more severe downturn will occur.

Analysis of data from the Tennessee Econometric Model (TEM) provides forecasts of output and employment in six durable goods industries and seven nondurable goods industries. The durable goods industries predicted by the Model include furniture and fixtures, fabricated metals, nonelectrical machinery, electrical machinery, transportation equipment, and other durables. Nondurables industries include food, textiles, apparel, paper, chemicals, rubber and plastic products, and other nondurables. In general, output is predicted by the equations in a particular manufacturing industry in Tennessee as a function of, among other things, the level of national output in the industry. In most cases, a rate of growth for Tennessee in

FIGURE 2

TENNESSEE MANUFACTURING EMPLOYMENT, 1969-1979 AND FORECAST, 1980-1981
(Periodic Recessions)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

excess of that for the nation is produced by the equations. This, of course, reflects actual trends over the past two decades.

In Table 3 is shown the behavior of employment changes for each of these industries over the most recent business cycle (the recession of 1973-75 and the expansion of 1976-78) and for the downturn of 1979-1980 (where 1980 is a forecast). In Figures 3 and 4 are given the employment changes for the individual years 1979, 1980, and 1981.

Long-Term Forecast

In addition to short-term forecasts, the Tennessee Econometric Model is capable of generating long-term projections of output, employment, and income. In this section some of these projections are analyzed for manufacturing and for particular manufacturing industries.

As noted, manufacturing holds a place of special importance in the State's economy. As suggested by our forecast, following the slowdown of 1979-1980, manufacturing output and employment in Tennessee can be expected to return to a level approaching their long-term growth rates. Moreover, these rates are expected to surpass moderately the counterpart rates for the nation. This long-term forecast is premised on the assumption that national economic policy will return to a more expansive stance later in 1980 and afterwards.

In Figures 5 and 6 are shown projected Tennessee employment growth in durables and nondurables manufacturing, respectively, for 1980 to 1988. For total manufacturing, achievement of these forecasts will result in employment growth of 74,300 jobs over the period.

TABLE 3

CHANGE IN TENNESSEE EMPLOYMENT DURING PERIODS OF ECONOMIC RECESSION AND ECONOMIC EXPANSION: SELECTED MANUFACTURING INDUSTRIES, 1973-1980

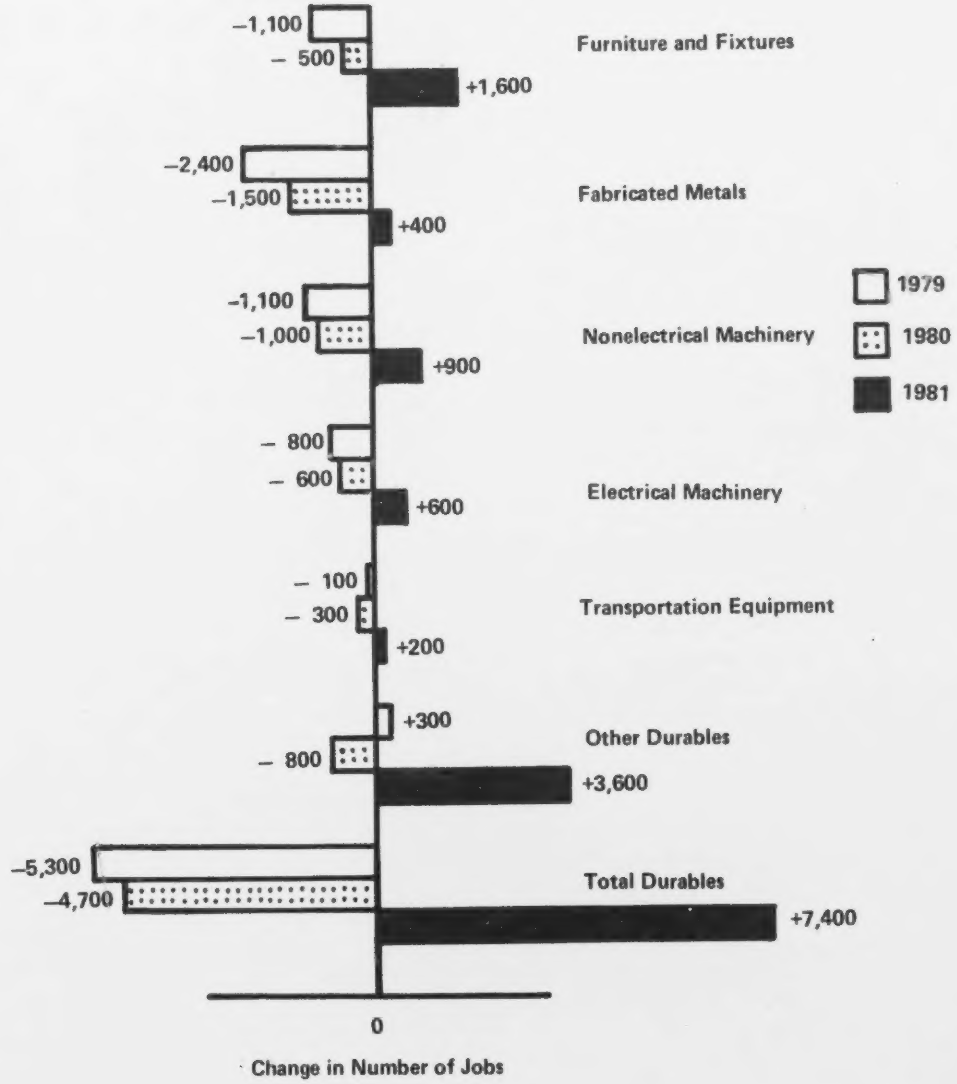
(Thousands of Jobs)

Sector	Recession (1973-75)	Expansion (1976-78)	Current Forecast (1979-1980)
Durable Goods	-36.8	42.3	-10.0
Furniture and Fixtures	-5.8	3.5	-1.6
Fabricated Metal Products	-2.7	3.2	-3.9
Nonelectrical Machinery	-4.9	7.7	-2.1
Electrical Machinery	-10.5	10.9	-1.4
Transportation Equipment	-4.6	7.0	-0.4
Other Durable Goods	-8.3	10.0	-0.5
Nondurable Goods	-23.6	21.0	-1.6
Food	0.3	1.4	-1.5
Textiles	-6.1	1.5	-2.2
Apparel	-9.9	5.9	3.6
Paper	-2.3	1.8	0.8
Chemicals	-2.0	2.1	-1.4
Rubber and Plastics	-1.0	5.6	-1.0
Other Nondurable Goods	-2.6	2.7	0.2
Total Manufacturing	-60.4	63.3	-11.6

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 3

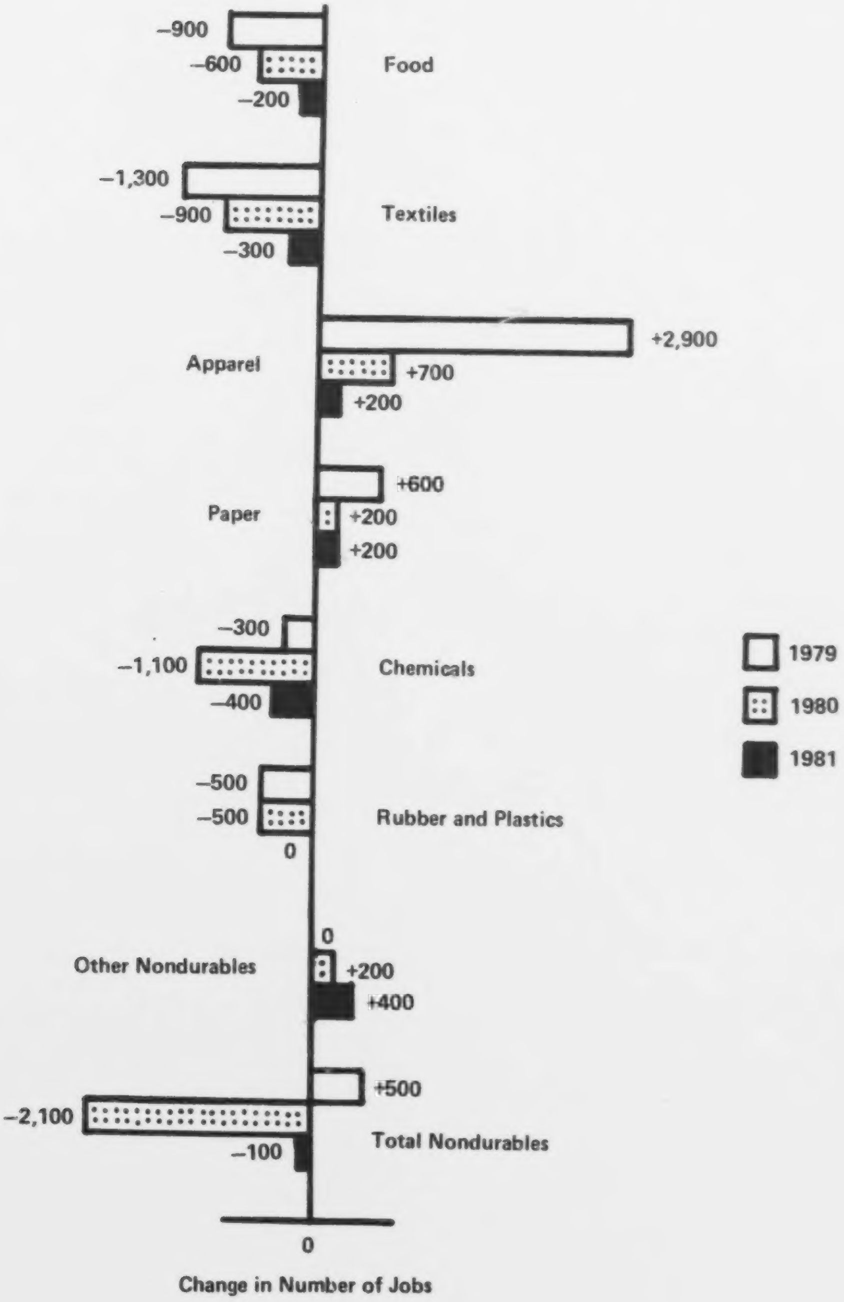
TENNESSEE DURABLES MANUFACTURING
EMPLOYMENT CHANGES BY INDUSTRY
1979, 1980, AND 1981



SOURCE: Tennessee Econometric Model, November 15, 1979.

FIGURE 4

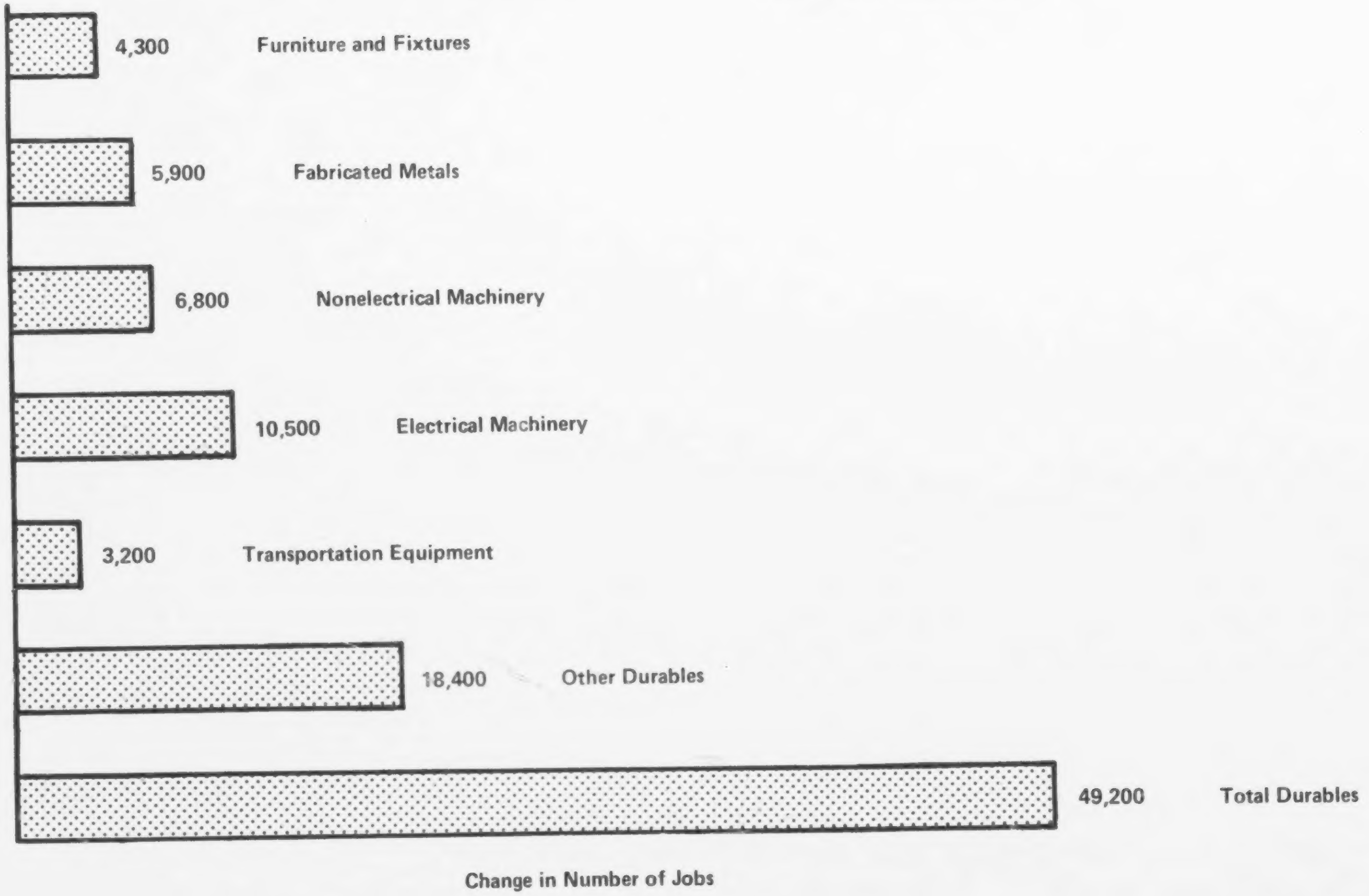
TENNESSEE NONDURABLES MANUFACTURING EMPLOYMENT CHANGES BY INDUSTRY 1979, 1980, AND 1981



SOURCE: Tennessee Econometric Model, November 15, 1979.

FIGURE 5

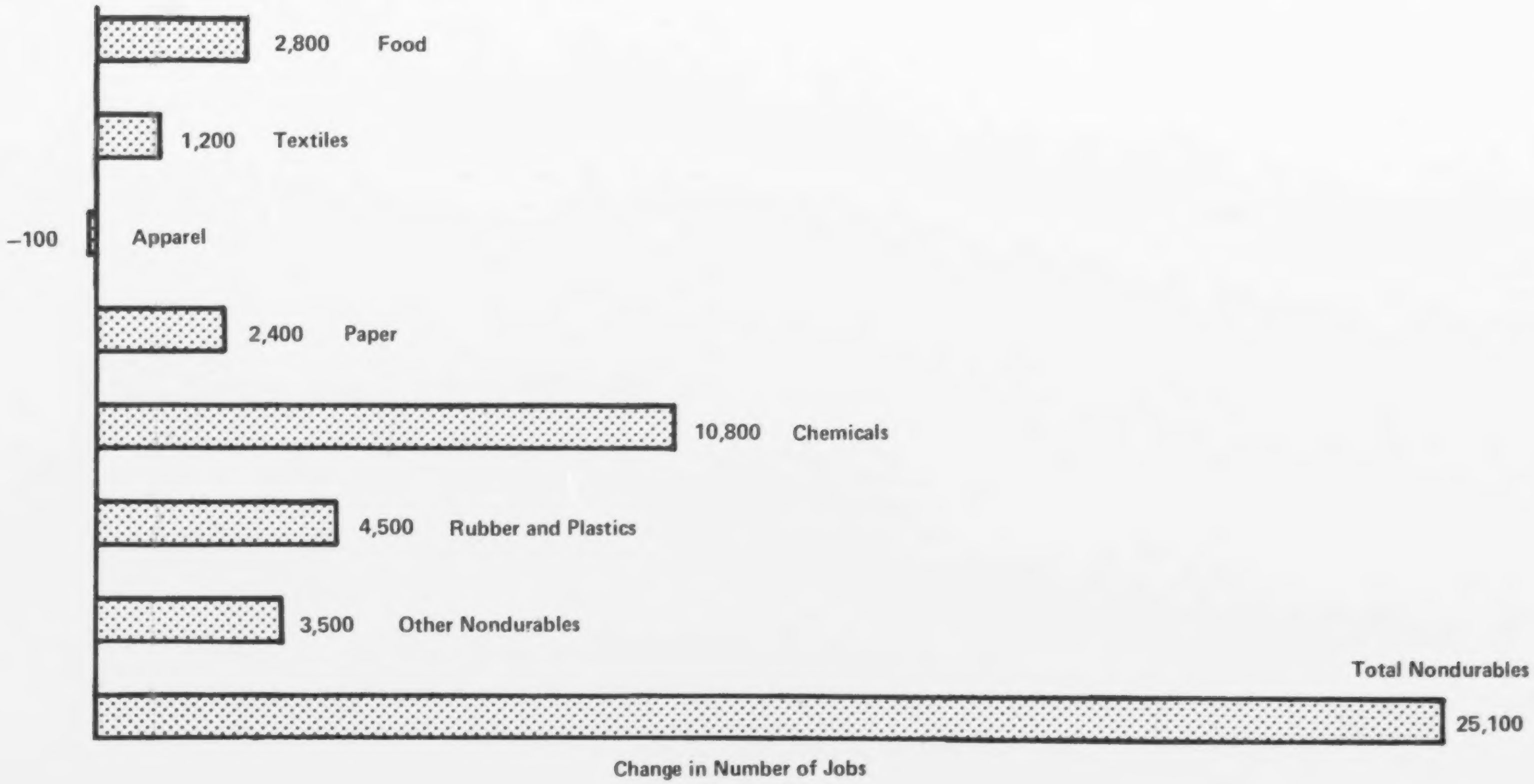
TENNESSEE DURABLES MANUFACTURING
EMPLOYMENT GAINS BY INDUSTRY
FORECAST: 1980 TO 1988



SOURCE: Tennessee Econometric Model, November 15, 1979.

FIGURE 6

TENNESSEE NONDURABLES MANUFACTURING
EMPLOYMENT GAINS BY INDUSTRY
FORECAST: 1980 TO 1988



SOURCE: Tennessee Econometric Model, November 15, 1979.

This compares with past periods such as 1960 to 1965 (71,700 new jobs), 1965 to 1970 (77,300 new jobs), and the cyclical period from 1970 to 1975, when manufacturing jobs showed a decline of 5,600. (In the three-year period 1975 to 1978, there was an increase of 63,300 new jobs.) The past periods were affected by recessions in 1960, 1969-1970, and 1973-75. In each case, manufacturing growth in Tennessee was interrupted, with the degree of the interruption depending on the severity of the recession.

The forecasts for long-run Tennessee manufacturing growth are based on past trends, reflecting growth rates in excess of those experienced by the nation as a whole. It is therefore useful to view long-term growth patterns. Such a view for the period of 1960 to 1979 is provided in Table 4, where growth in Tennessee is compared with that for the nation. Two major features emerge from the table: (1) the relative gain in employment has been much greater in Tennessee than in the nation and (2) growth in Tennessee has been broad-based, with almost all manufacturing industries enjoying impressive growth rates.

It will be seen that the decade of the 1980's is projected to be one in which durable goods continue their strong gains of recent years, becoming almost as important as nondurables by the end of the decade. Such a trend would be welcome in that wages in durables manufacturing typically are high. The trend provides evidence that Tennessee is attractive to a rather wide variety of manufacturers. As noted previously, however, a movement toward greater relative importance of durables increases the cyclical sensitivity of the State's economy.

TABLE 4

TENNESSEE AND UNITED STATES MANUFACTURING JOBS BY INDUSTRY, 1960 AND 1979

	Jobs (Thousands)			
Tennessee	1960	1979	Change 1960 to 1979	Percent Change 1960 to 1979
Durable Goods	115.6	231.6	116.0	100.3
Furniture and Fixtures	15.6	24.9	9.3	59.6
Fabricated Metals	17.6	32.1	14.5	82.4
Machinery except Electrical	9.3	34.5	25.2	271.0
Electrical Machinery	14.6	41.5	26.9	184.2
Transportation Equipment	6.2	24.5	18.3	295.2
Other Durable Goods	52.3	74.2	21.9	41.9
Nondurable Goods	200.0	285.9	85.9	43.0
Food	32.1	38.8	6.7	20.9
Textiles	31.6	27.3	-4.3	-13.6
Apparel	44.7	74.9	30.2	67.6
Paper	8.9	17.6	8.7	97.8
Chemicals	44.3	57.0	12.7	28.7
Rubber and Plastics	6.1	21.8	15.7	257.4
Other Nondurable Goods	32.3	48.5	16.2	50.2
Total Manufacturing	315.6	517.5	201.9	64.0
United States				
Total Manufacturing	16,795.0	20,846.0	4,051.0	24.1
Durable Goods	9,459.0	12,638.0	3,179.0	33.6
Nondurable Goods	7,336.0	8,208.0	872.0	11.9

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

The Importance of Policy

The implications of national economic policy actions for the performance of manufacturing in Tennessee have been stressed in this forecast. The experience of the 1960's and 1970's teaches that Tennessee performs very well during periods of steady application of expansive policy (as in the 1960's), but that periodic recessions induced by restrictive policies (as in the 1970's) make gains difficult to achieve. Obviously what is hoped for is that the 1980's will be free of such stop-and-go policies.

Achieving a recession-free decade after 1980, however, will not be an easy task if periodic fiscal and monetary restrictions are invoked to fight inflation.

Tennessee accordingly has a considerable stake in the choice of instruments to be chosen in the inflation battle. If the wage-price spiral can be brought under control without prolonged periods of negative or slow U.S. economic growth, Tennessee manufacturing will prosper. But if periodic recessions occur, the employment gains for the 1980's will be much less than those predicted here.

CHAPTER 3

ENERGY

Sector Response in Historical Perspective

Throughout much of the twentieth century continued growth in the usage of energy was taken for granted. Energy was abundant and its prices were relatively low. In fact, during much of the period energy prices tended to decline relative to the general price level. A falling real price coupled with population and output growth caused a rapid increase in the demand for energy until the beginning of the decade of the seventies. About that time, however, the nation's energy production from domestic oil and gas reserves peaked and then for oil began to decline. In addition the cost increases on petroleum products imposed by OPEC beginning in late 1973 simply institutionalized price pressures already in existence as a result of the developing supply limitations in the domestic market.

The changing situation in the American energy market in the 1970's provides a classic case study of economic forces in action. Two major determinants of the demand for a commodity or service are its price and its consumers' incomes. During the 1970's there have been major income (and output) and price shocks. On the income side, we can look at the impact of the recessions which began in 1969 and 1973 and also at the recession which appears to be in its early stages in the later portion of 1979. As far as prices are concerned, their general upward drift during the decade was broken by major upward jolts in 1973-74 and in 1978-79.

In Table 5 are shown several global indicators of energy demand such as total energy consumption, energy consumption per dollar of

TABLE 5

ENERGY COMPARISONS:
TENNESSEE AND THE UNITED STATES

Year	U.S. Total Energy Consumption (Quadrillions BTU's)	U.S. Total Energy Consumption to Gross National Product Ratio (Thousands BTU's per 1972 dollars)	U.S. Total Energy Consumption Per Capita (Millions BTU's per person)	Tennessee Total Energy Consumption (Trillions BTU's)	Tennessee Total Energy Consumption to Gross State Product Ratio (Thousands BTU's per 1972 dollars)	Tennessee Total Energy Consumption Per Capita (Millions BTU's per person)
1969	64.51	59.80	318.3	1,289.6	71.39	323.6
1970	66.82	62.14	326.1	1,347.0	73.83	342.6
1971	68.30	61.67	329.9	1,388.2	72.46	347.9
1972	71.63	61.16	343.0	1,519.9	72.36	377.1
1973	74.63	60.41	354.6	1,617.0	71.09	394.9
1974	72.35	59.41	341.4	1,477.6	65.59	356.1
1975	70.71	58.81	331.1	1,634.9	75.87	391.8
1976	74.16	58.26	344.7	1,718.3	74.30	405.8
1977	76.56	57.11	353.0	1,800.2	73.63	419.4
1978	78.01	55.75	356.9	1,810.1	69.70	415.4
1979	78.54	55.36	356.5	1,787.0	67.51	406.2

SOURCE: Wharton Econometric Forecasting Associates, Inc., Annual Model, Historical Data and September 24, 1979; Tennessee Econometric Model, Historical Data and November 15, 1979.

real gross product, and total energy consumption per capita for both the United States and Tennessee for the decade 1969 to 1979. In Column 1 is shown that for the United States as a whole, total energy consumption has risen substantially, but that the relatively deep recession which began in 1973 cut into energy usage so that by 1975 the level of consumption was lower than that in 1973. In addition, it is indicated in Column 2 that a gradual uncoupling of the close relationship between energy use and output growth is occurring. These figures show that energy use per dollar of real gross national product peaked in 1970 and has fallen rather substantially since that time. Certainly a major causal factor has been the rapid increase in energy prices relative to other prices, which has both induced and forced individuals and businesses to be more "conservation-minded." While energy consumption is falling relative to gross national product, energy use relative to population has continued to inch upward through 1978, as indicated by the figures in Column 3.

The picture of energy usage in Tennessee as shown in Table 5 is basically similar to that for the United States, although it does vary in detail. The 1973-74 recession did interrupt the growth in total energy use in Tennessee as it did for the nation as a whole. As far as the relationship between total energy use and output is concerned, the Tennessee picture is somewhat mixed. The trend of this ratio was downward from 1970 to 1974, jumped substantially in 1975, and has again tended to move downward in 1979. Comparing 1979 with 1969, however, both U.S. and Tennessee energy consumption per unit of output has fallen by 5 to 7 percent. Perhaps the most striking difference between the national and state figures is in per capita consumption. Per capita Tennessee energy consumption as shown in Column 6 has increased at a relatively rapid rate so that while the Tennessee figure was nearly 2 percent above the U.S. average in 1969, it was nearly 14 percent higher in 1979.

Overall, of course, the picture is one of restrained growth in energy demand. The restraint, however, has not been applied equally in all sectors of the economy. For the nation as a whole, industrial energy use is up only 8.9 percent for 1969 to 1978, and residential usage is up by 21.1 percent, while consumption in the transportation sector increased by 27.5 percent and commercial usage increased a whopping 44.1 percent. The pattern of this growth in Tennessee energy use by broad sector is shown in Figure 7. In part the growth in commercial usage is linked to the relative growth in the service portions of the economy as the system becomes more mature, but it may also reflect an area of opportunity as far as energy conservation is concerned. On the other hand, note that industrial and transportation uses together make up over 60 percent of total usage.

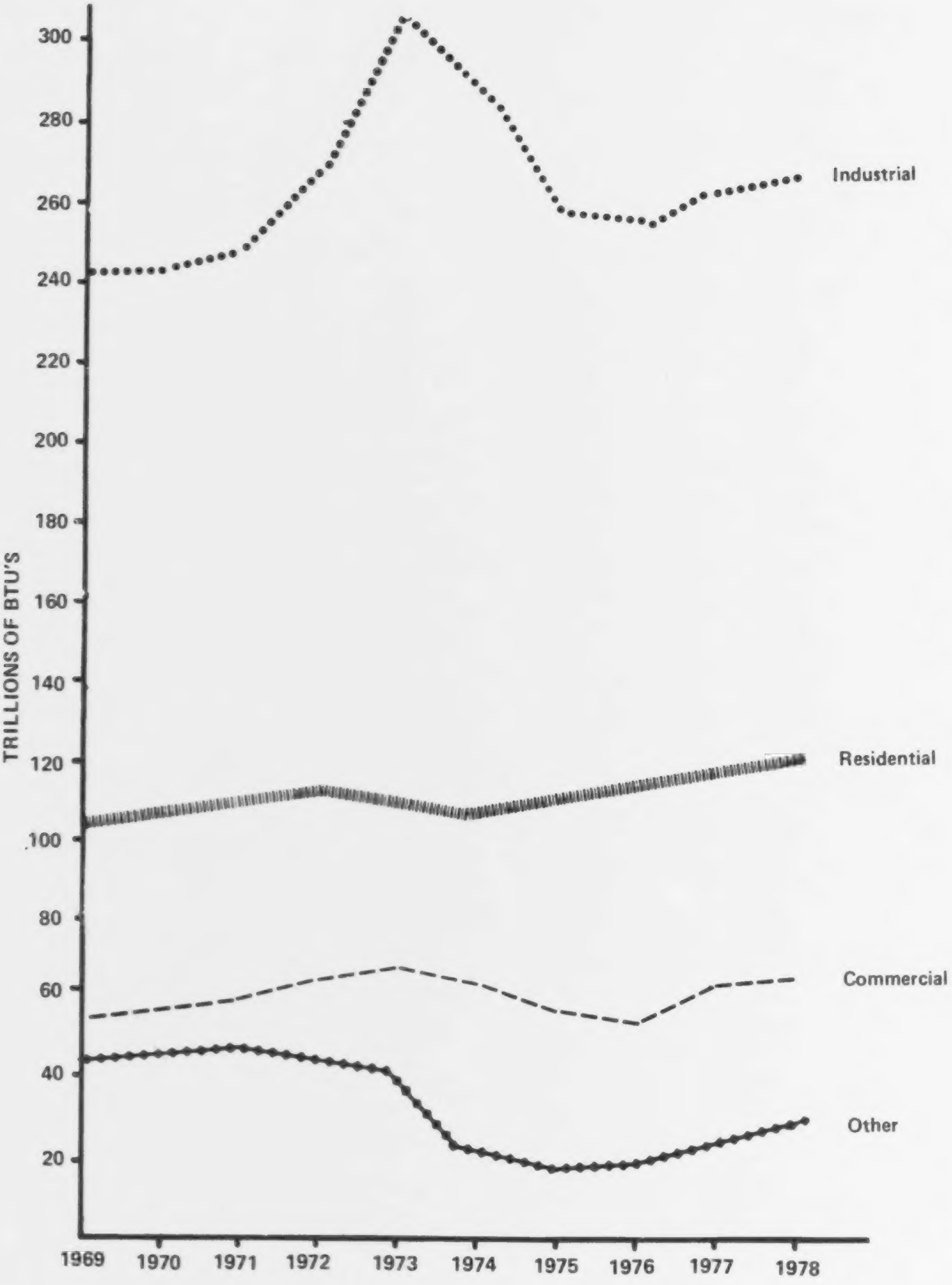
National Outlook

In Tennessee as in the nation and the world for that matter, "energy" is a question with much uncertainty, as the recent OPEC embargo and current Iranian crisis are demonstrating. Since many of these uncertainties are in the political as well as the economic realm, the difficulty in making energy consumption and price forecasts increases. The Tennessee energy forecast is based on a set of national and world energy assumptions used by the Wharton Asso-

FIGURE 7

ENERGY USAGE BY SECTOR IN BTU'S, TENNESSEE

(Electricity and Natural Gas Only)



SOURCE: Tennessee Econometric Model, Historical Data.

ciates in making their national forecasts. A crucial assumption embodied in the Wharton forecast presumes that the oil cartel will not dictate additional large price increases as occurred in the 1973-74 and 1979 years. In addition to this fundamental assumption, their forecast also assumes decontrolled domestic oil prices by 1982, a windfall profits tax of 60 percent, complete decontrol of natural gas by 1985, Mexican natural gas imports beginning in 1981, and an increased flow through the Alaskan pipeline to 2.0 million barrels per day (MMBD) by 1981. Using these assumptions, they forecast a slower national industrial demand for energy, a considerable shift to coal by industry, and expanded use of coal in electrical generation, so that net domestic crude oil imports are below the president's stated goal of 8.5 MMBD until 1990. In addition, Wharton projects that domestic oil consumption will decline from 1981 to 1986 and grow slowly thereafter. Throughout the forecast years they project that the proportion of U.S. energy coming from coal and nuclear sources will increase, whereas the proportions coming from oil and natural gas will decline.

Short-Term Forecast

In looking ahead for the next two years there are three factors which will have a major impact on the energy sector. The forces set in motion in past years as a result of the "energy crisis" will continue to have an impact. The uncoupling of energy demand growth and output growth will continue--perhaps at a somewhat accelerated pace as new technologies spawned by the events of earlier years of the decade begin to become more ubiquitous. Substantial improvements in automobile mileage figures will have an increasingly apparent effect on gasoline consumption; home insulation, solar hot water and other similar products will also have their impact. A second factor which will be important is the cyclical downturn which will accentuate the growth-retarding forces operating on energy use. Finally, the very large increase in petroleum prices put into effect in late 1978 and early 1979 will further restrict the growth of energy demand.

We can begin the examination of the short-term outlook by considering the price changes which are anticipated. Examination of Table 6 reveals continuing double-digit inflation in energy prices. Compared to the anticipated increases in the gross state product deflator, a rough generalization is that most energy prices are expected to increase at a rate about 50 percent greater than prices as a whole. Notable exceptions involve gasoline and fuel oil prices. During the three-year period of 1973-75, gasoline prices increased 89 percent in Tennessee, while fuel oil prices increased by 121 percent. During the 1976-78 period price increases for these commodities were more moderate, but for the 1979-1981 period a 61 percent increase in gasoline prices and a 45 percent increase in fuel oil prices is foreseen.

The projected conservation impacts of these price changes coupled with the weakening of overall state economic activity produce the energy consumption forecasts shown in Table 7. Note that stable gasoline consumption is projected. As has been widely observed, the lack of growth in gasoline demand coupled with a fixed cent-per-gallon motor fuel tax posed major fiscal problems for the State, which has relied heavily on gas tax revenues to finance road construction and maintenance programs.

TABLE 6

TENNESSEE ENERGY PRICES

	Year		
Sector	1979	1980	1981
Electricity (Cents/kilowatt-hour)	3.16	3.49	3.86
Percent Change	14.86	10.55	10.46
Residential	3.12	3.45	3.79
Percent Change	13.86	10.54	10.04
Commercial	3.92	4.33	4.78
Percent Change	13.91	10.46	10.51
Industrial	3.05	3.37	3.75
Percent Change	16.43	10.58	11.09
Total Natural Gas (Cents/therm)	20.0	22.4	25.1
Percent Change	13.18	11.96	12.06
Residential	21.7	23.9	26.7
Percent Change	12.19	10.43	11.54
Commercial	22.8	25.3	28.1
Percent Change	12.37	10.89	11.01
Industrial	18.3	20.7	23.4
Percent Change	14.20	13.35	12.89
Coal (Dollar/ton)	28.91	32.04	35.59
Percent Change	8.86	10.80	11.08
Gasoline (1967 = 100)	420.1	555.7	677.5
Percent Change	45.51	32.28	21.92
Fuel Oil (1967 = 100)	522.6	639.6	757.9
Percent Change	31.31	22.39	18.50

SOURCE: Tennessee Econometric Model, November 15, 1979.

TABLE 7

TENNESSEE ENERGY CONSUMPTION

Sector	1979	1980	1981
Electricity (Millions KWH)	52,214	52,682	54,676
Percent Change	2.68	0.90	3.79
Residential	26,681	27,474	28,399
Percent Change	3.26	2.97	3.37
Commercial	4,328	4,329	4,452
Percent Change	1.92	0.03	2.84
Industrial	21,206	20,879	21,825
Percent Change	2.11	-1.54	4.53
Total Gas (Millions therms)	1,906	1,908	1,912
Percent Change	0.18	0.07	0.23
Residential	487	487	485
Percent Change	0.01	-0.06	-0.38
Commercial	377	375	374
Percent Change	-0.56	-0.43	-0.27
Industrial	1,042	1,046	1,053
Percent Change	0.52	0.32	0.69
Coal (Thousand tons)	21,610	21,789	21,992
Percent Change	4.81	0.83	0.94
Gasoline (Million gallons)	2,599	2,604	2,599
Percent Change	0.42	0.17	-0.17
Fuel Oil (Thousand barrels)	25,016	25,111	25,689
Percent Change	1.89	0.38	2.30

SOURCE: Tennessee Econometric Model, November 15, 1979.

Natural gas consumption is expected to increase by an imperceptible amount, while fuel oil consumption will increase by only a small amount compared to historical rates of increase (even when compared to earlier periods of recession in the State economy).

The largest percent increase in consumption during the period is expected in electricity demand, which is projected to increase by a little more than 4.5 percent during the period. Residential demand will increase by nearly 6.5 percent, while commercial and industrial electricity consumption is expected to increase some 2.9 percent. Coal demand, which is largely a function of TVA's electrical generation, is expected to be relatively stable.

When energy consumption is examined on an overall basis for the period 1979 to 1981, the picture that emerges is one of virtually stable overall consumption. Relative to gross state product and population, energy consumption will actually fall slightly during the period.

Long-Term Forecast

In Table 8 the forecast growth rates of total energy consumption in the United States and Tennessee are compared. In Columns 1 through 4 are listed the forecast energy consumption levels in British Thermal Units (BTU's) for each area. After 1981 Tennessee's total energy consumption grows at a continuous rate of about 1 percent per year (see Column 3, Table 8). The growth rate in total U.S. consumption, on the other hand, will be about three-quarters of a percent until 1985 and then will accelerate to about 2 percent through 1988. The total energy consumption to real output ratios listed in Columns 5

TABLE 8

COMPARISONS OF UNITED STATES AND TENNESSEE TOTAL ENERGY CONSUMPTION AND TOTAL ENERGY CONSUMPTION TO REAL OUTPUT RATIO

(Thousands BTU's/1972 Dollars)

	Total Energy Consumption (Quadrillion BTU's)				Total Energy Consumption To Output Ratio			
	U.S.		Tennessee		U.S.		Tennessee	
Year	Total	Percent Change	Total	Percent Change	Total	Percent Change	Total	Percent Change
1981	79.73	1.6	1.808	0.9	53.78	-2.0	66.00	-2.4
1982	80.17	0.6	1.824	0.9	52.45	-2.5	64.71	-2.0
1983	80.64	0.6	1.842	1.0	51.39	-2.0	63.53	-1.8
1984	81.26	0.8	1.859	0.9	50.46	-1.8	62.30	-1.9
1985	81.99	0.9	1.879	1.1	49.64	-1.6	61.29	-1.6
1986	83.28	1.6	1.902	1.2	49.00	-1.3	60.11	-1.9
1987	85.25	2.4	1.917	0.8	48.45	-1.1	58.49	-2.7
1988	87.22	2.3	1.937	1.0	48.01	-0.9	57.04	-2.5

SOURCE: Wharton Econometric Forecasting Associates, Inc., Annual Model, September 24, 1979; Tennessee Econometric Model, November 15, 1979.

through 8 in Table 8 offer considerable insight into the relationship between energy usage and economic growth in the two areas. Many authors have concluded that the energy-to-output ratio is a constant. Therefore in order to reduce the amount of energy utilized in the economy, real output growth must fall as the energy growth rate is reduced. First, throughout these forecast years real Tennessee and U.S. outputs are projected to grow at similar rates--3.1 and 2.9 percent, respectively. Yet, as clearly shown in Columns 5 and 7, the energy-to-output ratios fall considerably over these years as energy is used more efficiently due to the recent and continuing price increases and supply limitations. Since the Tennessee ratio declines by more than the U.S. ratio, it appears that Tennessee industries and households are more sensitive than their national counterparts to these price increases and supply changes. Moreover, Tennesseans use more energy per unit of output than do national users, as is indicated by their higher energy-to-output ratio. In short, considerable efficiencies in the use of energy are obtainable without a concomitant reduction in the State's output growth rate. (That is, the gradual decoupling of energy and output growth rates developed earlier is expected to continue throughout at least 1988.) Therefore, federal or state policies to aid or reinforce this conservation process (such as energy-saving investment tax credits) should not drastically harm the State's long-term growth potential.

The average annual growth rates of Tennessee energy prices are listed in Table 9. A comparison of Column 1, which includes the entire forecast period, and Column 2, which includes only the 1982 to 1988 years, indicates all are expected to slow in the longer term.

TABLE 9

TENNESSEE AVERAGE ANNUAL GROWTH RATES OF ENERGY PRICES

(Average Annual Percent Change)

	1979-1988	1982-1988
Electricity		
Total	8.82	7.47
Residential	8.40	7.09
Commercial	8.80	7.58
Industrial	9.39	7.97
Natural Gas		
Total	11.47	11.07
Residential	10.49	10.11
Commercial	10.66	10.33
Industrial	12.35	11.87
Coal	8.93	8.36
Gasoline	15.70	8.19
Fuel Oil	13.19	8.53
Implicit Price Deflator		
All Industries-Tennessee	6.84	6.35

SOURCE: Tennessee Econometric Model, November 15, 1979.

Because natural gas prices will not be completely decontrolled until 1985, their prices increase much faster than do other energy prices. Since all energy prices are growing faster than the state implicit price deflator (6.35 percent), Tennessee real energy prices are expected to continue rising, making energy even more expensive relative to other goods. In these longer-term forecasts, energy prices grow on average about 30 percent faster than prices in general, which is a slowdown from the 50 percent rate of growth in the 1979 through 1981 years.

The average annual growth rates of electricity, natural gas, coal, gasoline, and fuel oil for the 1969 to 1978 and 1982 to 1988 years are presented in Table 10. The percentages developed in Table 10 are based on physical quantities (such as kilowatt hours) instead of BTU's. As detailed in Column 2, in general, the post-1981 growth rates within each sector are similar, but the growth rates among sectors vary considerably. Total electricity consumption is projected to grow the quickest at about 3.5 percent, with the industrial sector displaying the fastest growth rate at 4 percent and the commercial and residential sectors the slowest growth rates at 2.6 and 3.2 percent, respectively. Although industrial natural gas consumption grows slightly (0.4 of 1 percent), it is offset by declines in the consumption of natural gas in the residential and commercial sectors (-0.6 and -0.3 of 1 percent, respectively) so that total natural gas consumption displays essentially no growth. Coal, gasoline, and fuel oil consumptions also display little growth in the 1982 to 1988 years at 0.57, 0.58, and 1.03 percent, respectively.

TABLE 10

COMPARISONS OF TENNESSEE AVERAGE ANNUAL ENERGY CONSUMPTION GROWTH RATES BY ENERGY TYPE

(Average Annual Percent Change)

Energy Type	1969-1978	1982-1988
Electricity		
Total	5.10	3.49
Residential	4.89	3.22
Commercial	3.53	2.55
Industrial	5.79	4.02
Natural Gas		
Total	-0.19	0.01
Residential	1.25	-0.64
Commercial	1.41	-0.32
Industrial	-1.04	0.41
Coal	5.37	0.57
Gasoline	4.76	0.58
Fuel Oil	8.99	1.03
Gross State Product	4.20	3.11

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

In Column 1 of Table 10 are presented the 1969 to 1978 average annual growth rates for gross state product and for each type of energy. It is obvious that the higher energy prices, due to OPEC and domestic decontrol, along with slower than pre-forecast period output growth rate, will dramatically reduce the rate of growth in energy consumption. Only natural gas displays faster growth in the forecast period, moving from slightly negative to essentially no growth. Since natural gas prices are expected to grow quickly in the forecast years, the growth in its consumption seems contradictory. The decontrol of interstate natural gas prices will, however, expand the supply of existing gas in these markets, and this supply will be more certain. Given the environmental advantages to using this clean-burning fuel, its total usage is expected to remain at present levels in the State of Tennessee throughout the forecast years.

The slow growth rate projected for coal is unexpected, especially given the stress placed on it in Carter's National Energy Plan as an alternative to imported oil. One reason coal consumption grows slowly is that no new TVA coal-fired plants are expected to come on line before 1989 and because existing TVA coal-fired plants are operating near capacity. Finally, the implicit substitution of a newer, more fuel-efficient automobile stock in the forecast years is also contributing to the slowdown in the State's growth rate of gasoline consumption.

In summary, real Tennessee energy prices are expected to continue to rise in the 1982 to 1988 years. As these prices rise and make energy more expensive relative to other goods, the growth rate in all of the energy sectors, except natural gas, is forecast to slow considerably. The rate of energy consumption also slows relative to the pre-forecast 10 years due to a slower projected rate of output growth in the 1982 to 1988 years. The slowdown in the growth rate of total energy consumption is, however, much greater than is the slowdown in the growth rate of total output, indicating that the State's energy-to-output ratio will continue to decline. Stated alternatively, substantially slower growth rates in energy consumption are compatible with continuing growth of the State's economy.

A Short Note on Policy Perspectives

Although a clear national energy policy still remains to be formulated, this does not imply that a state government cannot influence the level of energy consumption within its boundaries. In California, for example, the state has enacted various incentives ranging from tax credits to building code revisions that stress solar energy, and these policies have helped to make it into the most solarized state in the nation. As indicated by the forecasts, Tennessee's economic growth is compatible with lower levels of energy utilization, and keeping the California experience in mind, state government policy can play a guiding role in the transition to a less energy-intensive economy.

Since the State is not a major energy producer and cannot hope to be, policies supporting an expanded exploration program are not reasonable. Policies which support a more efficient use of the existing energy equipment and which support the move to a more efficient stock are, however, more reasonable.

Conservation represents one of the largest untapped sources of energy savings that exists as an alternative to the existing fuels. In addition, as already discussed, conservation (or the reduction in energy used per unit of output) is consistent with continuous economic growth. The state government could offer incentives through tax credits to firms and individuals that implement conservation-minded investments. The State can through its energy offices set up an energy extension service to inform the public on the worth of these investments and then help in their implementation through low interest loans. In addition, the State can implement building codes that are more conservation-oriented. Finally, the State can support an electricity rate structure that induces firms and households to more efficiently use electricity. This can be accomplished by moving from a block decreasing to a block constant or an increasing rate structure. Initially, this will induce users to operate existing equipment and facilities more efficiently. Over the long run, these rate structure changes will induce users to switch to more electricity-efficient types of equipment and facilities. To speed the switching process, the State can offer investment or consumption tax credits to reduce the costs, to firms and families, of purchasing the new equipment or facilities.

The State can also support the shift to small-scale solar heating and cooling of existing and new structures through incentives similar to those implemented in California.

Small-scale solar technology exists and it can be implemented on an economic basis. In addition, it is a renewable source and it is not imported from an interruptable source. Therefore, the benefits and costs of solar technology for Tennessee ought to be determined and if its benefits exceed its costs, it ought to be supported through State government policy.

CHAPTER 4

FINANCE, INSURANCE, AND REAL ESTATE

Finance and Banking

In the Tennessee Econometric Model, finance, insurance, and real estate (FIRE) are treated as one sector for purposes of estimating employment, wages, and output. Yet, at times the sector is treated in its disaggregated parts. For example, aggregate balance sheets for both commercial banks and for savings and loan associations are produced by the Model. Further, insurance and real estate are evaluated separately. Therefore, FIRE among all of the Model's sectors, represents a uniquely difficult sector to describe as a forecast.

The Historical Record of the FIRE Sector

Since 1973-75 represents the most recent period of downturn in the State's economy, historically, changes in gross output for the FIRE sector and the State economy are compared for that period, and then the components of this change are examined. Changes in gross state product and gross state product originating in the FIRE sector in current dollars are as follows:

	1973	1974	1975	1976
Gross State Product (Percent change)	13.9	8.8	4.7	13.0
Gross Output Originating in FIRE (Percent change)	10.0	9.8	8.6	12.2

The decline and recovery in the rate of growth in gross state product is readily apparent from these percentages. Equally striking, however, is what appears to be an immunity of the FIRE sector to these swings in economic growth. The rate of growth for the sector is retarded only slightly during the recession, in contrast to the marked swing in the gross state product.

The above figures include price increases as well as changes in real output. When output is measured in constant (1972) dollars, the percent changes in rates of real growth for gross state product and gross state product from the FIRE sector are as follows:

	1973	1974	1975	1976
Gross State Product (Percent change)	8.3	-1.0	-4.3	7.3
Gross Output (FIRE) (Percent change)	4.1	0.7	-1.0	6.8

From these numbers it can be seen that the effects of the recession on real rates of growth are more apparent, and most of the apparent immunity of the sector from economic fluctuations has been due to differing rates of inflation among sectors, with prices rising relatively faster in the FIRE sector. However, the changes in real growth rates over time are smaller for the FIRE sector than for the economy as a whole.

Since employment within the FIRE sector depends on the output of the sector, the percent changes in employment in the State and the percent changes in the FIRE sector are related:

	1973	1974	1975	1976
Tennessee Employment (Percent change)	5.6	1.8	-3.4	4.6
FIRE Employment (Percent change)	8.0	5.1	-0.9	0.6

During this recession there was nearly no actual decrease in FIRE employment. However, the decreases in employment in the FIRE sector from its growth trend were as great as for the State as a whole and the sector recovered the size of its labor force more slowly than the rest of the economy when the recession had ended. Thus, the seeming stability in employment for the FIRE sector was due to less variable output and strong growth coming into the downturn.

To determine how employees in the FIRE sector fared relative to employees in the State as a whole, the percent change in average annual wages in constant dollars is examined. The actual percent change was the change in constant dollars plus the annual inflation rate. Since the FIRE sector is largely a service sector and is labor-intensive, this gives an indication of changes in the major cost component of the industry.

	1973	1974	1975	1976
Annual Wage (All employees) (Percent change)	1.1	-1.9	-0.2	1.7
Annual Wage (FIRE) (Percent change)	0.5	-3.9	-1.9	3.2

Obviously, wages and salaries in the FIRE sector are more flexible than those in some of the other sectors. During the 1973-75 recession, while employment reduction was smaller in the FIRE sector than other sectors, real wage and salary reduction was greater in the FIRE sector.

During the 1973-75 period within the FIRE industry, the rate of deposit growth of the commercial banking industry diminished significantly, with the major decreases occurring in demand deposit and only minor decreases in the growth rate of time deposits. The growth rates for 1973-76 are as follows:

	1973	1974	1975	1976
Total Deposits (Percent change)	13.2	5.1	6.6	8.8
Demand Deposits (Percent change)	8.7	-2.9	2.6	3.5
Time Deposits (Percent change)	16.8	11.1	9.2	12.1

During the period there were only minor shifts in the loan-to-deposit ratios, which fell from 65.0 percent in 1973 to 62.6 percent in 1975, due to the fact that loan growth was substantially less than the growth in deposits in 1975. Also, the average yield on loans grew from 8.7 percent in 1973 to 9.8 percent in 1974 and returned in 1975 approximately to its 1973 level. The fluctuations in the federal funds rate during this period were much more pronounced, going from 8.7 percent in 1973 to 10.5 in 1974, and then dropping to 5.8 percent in 1975. Thus, from the standpoint of bank profitability, 1975 was a better year than 1974 due to the large decrease in the cost of funds. However, because of sluggish loan growth, bank profitability was lower in 1975 than during the 1973 pre-recession level.

FIRE Short-Term Forecast

To a large extent the forecast by the Tennessee Econometric Model for 1980-81 does not parallel events which took place in 1974-75. Not only are the numbers different, but the patterns are as well.

The rate of growth in the output of the FIRE sector is expected to be somewhat less than the growth in the total economy for the 1979-1980 period. The forecast numbers for the percent change in gross state product and the rate of growth in the contribution to gross state product by the FIRE sector are as follows:

	1979	1980	1981
Gross State Product (Percent change)	10.7	8.1	10.9
Gross Output (FIRE) (Percent change)	11.2	8.1	9.9

The decrease in the growth rate of the FIRE sector is expected to be more pronounced than for the total State and the recovery not as great. Although these differences are not great, they represent a departure from the pattern observed during the 1973-75 period. The growth shown in these figures reflects both real growth and inflation, however, and inflation is a major underlying cause for the differences.

The growth rates for the 1979-1981 period in real gross state product and real output in the FIRE sector are as follows:

	1979	1980	1981
Gross State Product (Percent change)	1.9	-0.0	3.5
FIRE Real Output (Percent change)	2.9	-0.2	2.1

These rates indicate that real output in the FIRE sector is expected to decrease during 1980 and rebound somewhat in 1981. However, growth in the FIRE sector is expected to be slower than in the State's economy as a whole. This echoes that the basic pattern will be somewhat different from the pattern observed during the 1973-75 recession.

If growth in employment is analyzed, the pattern still does not reproduce that of the earlier recession. The growth rate for employment in the State and the FIRE sector are as follows:

	1979	1980	1981
Tennessee Employment (Percent change)	1.4	0.4	1.4
FIRE Employment (Percent change)	3.1	0.4	1.9

Although the rate of growth in employment is expected to be as small for the FIRE sector as for the total State in 1980, it is forecast to rebound more strongly in 1981. Growth rates in employment in this sector are forecast to be more variable than for all industries.

One measure which does produce a similarity with the previous recession is the responsiveness of wages to changing economic conditions. The real average annual wage of employees in the FIRE sector is expected to decrease more during the recession and increase by a larger percent during the recovery. The expected percent changes in average annual real average wage are as follows:

	1979	1980	1981
Tennessee Real Wages (Percent change)	-0.1	0.5	1.8
FIRE Real Wages (Percent change)	-0.5	0.3	1.9

To the extent that wages and salaries are major cost factors in the FIRE sector, then labor costs will be relatively less in this sector during the recession and relatively larger during the recovery.

With the rate of employment of the FIRE sector equalling the rate of increase of employment in the State for 1980 and the real average wage increasing less rapidly, the contribution to gross state product by the FIRE sector will decrease, with gross state product remaining constant. Also, in 1981, employment and average wage in the FIRE sector will increase at a faster rate than overall employment and average wage, but gross state product contribution by the FIRE sector will increase less than the overall percent increase in gross state product.

The major differences between 1973-75 and the forecast for 1980-81 are larger relative decreases in the rate of growth in sector employment, compared to the changes for the State as a whole in 1980-81. Absolute employment changes, however, are not as large. The one similarity is that FIRE sector employees will experience the pattern of decreasing average wage more than other employees in the state, but will recover faster during 1981.

For the banking sector the rate of growth of loans is expected to be about 8.0 percent in both 1980 and 1981, with deposits growing by only 6.4 percent in 1980 and then by 8.0 percent in 1981. The loan-to-deposit ratios are forecast to average about 68 percent in both years, up slightly from the 1979 level of 67 percent. With the sluggish growth in deposits, the loan-to-deposit ratio might be expected to grow faster, but consumer demand for automobiles is forecast to be weak in 1980 and to rebound substantially in 1981, a factor which partially accounts for the low loan demand. Because of weak loan demand and a relatively high cost of funds, bank profitability is expected to be below its 1977 and 1978 levels.

For the FIRE sector 1980-81 is expected to be a period of slow growth and disappointing earnings for the firms in the sector. Generally, this sector will not fare as well in either year as will the economy of the State, a development due largely to decreased demand which results from high interest rates. To the extent that inflation is expected to continue at high levels, interest rates will also continue at high levels and loan demand for mortgages and consumption goods will remain low.

The economic phenomena which are most damaging to the FIRE sector are unemployment, high interest rates, tight money, and inflation. These are not, however, unmixed hindrances to activity within this sector. For example, inflation may stimulate activity in the real estate industry as people invest in real estate as a hedge against inflation. Also, insured values and premiums generally rise with inflation. Nevertheless, the FIRE sector flourishes when other sectors of the economy flourish. By pursuing policies which will improve the state of the economy with respect to these measures of economic well-being, government and monetary authorities will improve the performance in the FIRE sector of the economy.

FIRE Long-Term Forecast

Whereas gross state product is expected to increase by over 9.5 percent per year from 1982-88, the annual percent increase in the contribution by the FIRE sector is forecast to be less than 8.5 percent. These percentages embody anticipated inflation as well as real growth. The real growth in gross state product is forecast to be slightly over 3 percent per year and the real annual growth in the FIRE contribution at less than 2 percent per year. In this section the underlying causes of this less-than-average growth are examined.

The annual rate of growth in number of people employed is forecast to be 1.5 percent, a figure which is the same as the annual growth in employment for the nonagricultural sectors of the State. For the FIRE sector the annual increases are expected to be small in the early years and large from 1986-88. This pattern is also exhibited by the State as a whole and matches the growth pattern of the labor force. Also, the unemployment rate for the State diminishes during the entire period, with the largest decreases forecast for the last two years. However, the reason for the less-than-average growth in the FIRE sector is not due to less-than-average growth in employment.

Examination of the rate of growth of output per employee tells the story. For the State, output per employee is forecast to increase at 1.7 percent per year. This figure, coupled with the 1.5 percent annual increase in employment, gives the greater than 3 percent growth in gross state product per year. For the FIRE sector, productivity increases are expected to average about 0.4 percent annually. Combining this with the 1.5 percent employment increase produces a growth rate in output of slightly less than 2 percent. Hence, the reason for the lag in output growth for the FIRE sector is the expected productivity lag.

For the State, annual wage and salary increases are expected to average about 7.5 percent, including approximately a 6 percent inflation factor. Thus, real wage of employees should average about 1.5 percent per year, an average which is slightly less than the anticipated growth in productivity of 1.7 percent. For FIRE sector employees annual wage is expected to increase by approximately 2 percent per year, a figure which is much greater than their 0.4 percent annual productivity increase and also greater than the average annual increase of all employees.

The banking industry is forecast to have strong growth in deposits and loan demand. Deposits are forecast to grow at almost 11 percent per year, with time deposits growing at a faster rate than demand deposits. However, loan demand is expected to grow at over 12 percent per year, a growth which will cause the loan-to-deposit ratio to increase gradually over the period from a forecast value of 0.68 in 1981 to 0.74 in 1988. The loan demand stems from an anticipated healthy growth in the manufacturing sector and also, to a lesser extent, growth in consumer demand for durable goods. With gradually decreasing interest rates, this will be a healthy period for the banking industry.

FIRE Subsector: Insurance

Life Insurance Short-Term Forecast

For an indication of recent life insurance sales in Tennessee, it is useful to examine recent U.S. life sales data. For the first eight months of 1979, ordinary (individually purchased policy larger than $1,000) life insurance sales were up 15.5 percent over the same 1978 period, group life sales were up 18.9 percent, and industrial life sales were down 6.2 percent. Total sales for the eight-month period were up 16.1 percent. Group insurance sales for August were especially strong, up 52.7 percent from August 1978.[1] While these figures point to a satisfying year, it should be noted that August ordinary sales were actually down slightly from May ordinary sales, and the industrial sales decline is greater than normal. In Table 11

---

[1] "Life Sales," Best's Review, life/health insurance ed., November 1979, p. 52. Data were compiled by Life Insurance Marketing and Research Association and the data exclude revivals, increases, dividend additions, and reinsurance acquired.

TABLE 11

ACTUAL[a] AND ESTIMATED PURCHASES OF ORDINARY LIFE INSURANCE IN TENNESSEE

(In Hundreds of Thousands of Dollars)

Year	Amount	Change from Previous Year (Percent)
1972	2,722	
1973	3,108	14.2
1974	3,534	13.7
1975	3,736	5.7
1976	4,436	18.7
1977	5,140	15.9
1978	5,709	11.1
1979	6,337 estimate	11.0 estimate
1980	6,857 estimate	8.2 estimate
1981	7,885 estimate	15.0 estimate

a. Actual data sources are Life Insurance Marketing and Research Association and American Council of Life Insurance in 1979 Life Insurance Fact Book (Washington: American Council of Life Insurance), p. 12. Estimates by A. Auxier.

the actual and estimated purchases of ordinary life insurance in Tennessee for the 1972 to 1981 period are presented, along with the percent changes from the previous year.

A major negative trend at this time is that insurance buyers are showing a preference for term and group insurance at the expense of more profitable cash value insurance sales. To illustrate, term sales were 52 percent of ordinary sales in 1978, up from 46 percent in 1974.[2] Inflation is surely an important cause of this trend since cash value insurance represents, to an important extent, a fixed income investment, and fixed income investments do not fare well in inflationary periods. (Inflation is a two-edged sword for life insurance sales; it cuts demand for saving through cash value insurance, all other things being equal, but it increases the demand for death protection. Also, inflation causes higher interest rates and this benefits stockholders and participating policyholders by increasing, respectively, their earnings and dividends.) Another negative aspect is the improvement in group insurance and social security survivorship benefits, which are reducing both term and cash value insurance sales and agents' commissions. Finally, later marriages and smaller families are demographic trends which are adversely affecting life insurance sales. These factors are causing life insurance premium growth to be sluggish; the 1978 premium figure was up only 8.4 percent over 1977's.[3]

---

[2] 1979 Life Insurance Fact Book, (Washington: American Council of Life Insurance), p. 10.

[3] Ibid.

A Carter Administration-supported hospital cost containment bill was recently defeated in Congress. Unless this bill is revived--and the Administration hasn't given up on it--the passage of even watered-down national health insurance legislation seems unlikely in the very near term. However, some Americans are uninsurable or insurable only at unaffordable rates, they are badly in need of catastrophic protection at the least, and they are likely to be furnished with this protection soon, perhaps as early as 1981.

The life insurance industry has been rocked in the recent past by a great deal of unfavorable publicity, much of which has come from the Federal Trade Commission (FTC). This publicity has been most damaging to industrial and whole life sales, the former by a January 1979 FTC report by Elizabeth D. Laporte, Life Insurance Sold to the Poor: Industrial and Other Debit Insurance, and the latter by a July 1979 FTC report, Life Insurance Cost Disclosure. In the latter report the FTC found that life insurance policyholders, on average, earned only a 1.3 percent rate of return on their savings in 1977. Although this return is controversial and widely disputed, it nevertheless received great publicity. The FTC feels that price competition in the life insurance industry is inadequate, and as a corrective measure, it is pushing the states to adopt rate-of-return cost disclosure on the savings element of cash value insurance premiums. In the next year or two, at least one or two states will likely adopt rate-of-return disclosure, and if so, this should produce at least slightly greater price competition in the life industry and it could accelerate the present term insurance trend. Should rate-of-return disclosure become widespread in the short run, it might do considerable damage to life industry earnings and agent commissions. But the long-run damage might not be great; this would be true if companies are able to offer competitive rates of return on cash value policy savings--which should be the case--and if these competitive rates of return greatly improve the industry's standing with the public.

Life insurance companies should not be affected much by this recession, unless it should prove long and severe. The reasons are that lapse rates do not increase much in a recession, and renewal income accounts for about 80 percent of premium income. Moreover, ordinary sales should increase despite the recession, albeit at a below normal growth rate. Also, historically high interest rates are providing the companies with large boosts in investment income, and companies should continue to benefit from improving mortality. Thus, life companies should fare well in 1980, and they should benefit from robust sales as the economy recovers from the recession in 1981. However, a significant negative aspect of high interest rates is that they have sharply increased policy loans.

While established life agents should not fare badly in the recession, they are not so well off as their companies. Fairly predictable renewal income and some increase in new sales are favorable factors for agents. Another favorable factor for Tennessee agents who sell P&L insurance is that this business should be healthy in 1980-81. Unfavorable factors for agents include increased difficulty in making new sales in a recession year and continued inflation in travel and entertainment costs. On balance, most established agents should experience some income improvement in 1980-81, but newer agents may find these years tough.

Life Insurance Industry Long-Term Forecast

The life insurance industry's share of disposable personal income has been dropping steadily in recent years, from about 2.48 percent in 1965 to 1.81 percent in 1978.[4] Adjusted for inflation, premium growth for 1978-79 will surely be negative. True, declining mortality and high investment earnings have combined to produce high life insurance industry earnings. But the fact is that over the 1982-88 period the life industry is going to have to compete better for premium dollars and savings or it will become a declining industry in real terms. While the outcome is in doubt, there are encouraging considerations.

Annuity income should continue to advance nicely in the 1980's. Any national health insurance plan is likely to contain a significant role for life companies, and thus health insurance will continue to be a major contributor to revenues and a minor contributor to profitability. Mortality experience should improve at least moderately. Because of inflation and real income gains, group life seems likely to continue its rapid growth. The life industry's new share of the property/liability insurance area should make a positive contribution to agent commissions, premiums, and profits over the long term. The industry has developed in recent years some promising new products, among them adjustable and variable life policies, and these will make a contribution. The industry's bread-and-butter product, cash value insurance, can become more competitive vis-à-vis alternative savings media by adopting an investment year basis, as opposed to a portfolio basis for dividend illustrations. (An investment year basis would, in effect, permit insurers to pay the going interest rate on the savings element of cash value insurance premiums; the portfolio method permits payment of only an average of past interest rates on the savings element.) In fact, the adoption of the investment year basis appears to be absolutely necessary. If so, the sooner, the better, because rate-of-return disclosure for cash value policies should become widespread over the next several years, and the industry should be prepared for it when it arrives. Finally, even the healthy growth in term insurance bodes well for the long-term viability of the life industry because these sales are profitable, too. Thus, there is a sound basis for guarded optimism with regard to the life industry's future. There is opportunity here if the industry will only grab hold of it.

---

[4] 1979 Life Insurance Fact Book (Washington: American Council of Life Insurance), p. 58.

If the life industry is to realize its promise, it must have enlightened regulation. A pressing problem at this time is the need to improve the industry's image. Too many people feel that life insurance is a rip-off, and in fact, many policies ought to offer better value than they do. In particular, it would be helpful if regulators would do more to discourage unfair competition. One example would be to require all companies which are voluntarily offering rate-of-return disclosure for cash value policies on request to use the same low-cost term insurance rates in their rate-of-return calculations. Another example would be to require all participating policies to employ a similar investment year (or portfolio) dividend formula in order to make comparable different companies' dividend illustrations. Finally, good state regulation requires that state insurance department budgets be enlarged so that they can properly carry out their functions. But in the final analysis, whether the industry receives enlightened regulation often depends on whether the industry supports it. The danger is that the industry will not support this regulation and if this is the case, federal regulation of the life industry becomes more probable.

Some form of national health insurance legislation should be passed in the 1982-88 period, if not sooner. The basic reason this legislation will be passed is that health insurance for catastrophic illness and injuries is a necessity, and yet there are people who cannot buy it because they are uninsurable or because they cannot afford it. This legislation will likely contain a significant role for private health insurance carriers, and it probably will not adversely affect the profitability of this market. Finally, any NHI legislation is likely to be confined essentially to catastrophic illness and injuries where no group insurance is applicable because a comprehensive plan would be inflationary and quite expensive, and there is much less need for such a plan. U.S. life companies' total premium income increased 8.9 percent in 1978.[5] The gain for 1979 was probably only slightly better than 1978's performance. Life company premium volume in Tennessee has been stronger than the national economy, so Tennessee's premium volume gain was somewhat higher. On the average, premiums in Tennessee should grow about 10 percent per annum over the 1982-88 period. Annuity premiums should experience a little better growth over the 1982-88 period than total premiums. Inflation and real economic growth will boost these sums, and the tax, safety, and yield features of deferred annuities make them attractive to investors. Likewise, health insurance premiums should grow at a significantly faster pace than total premiums because of the greater expected inflation in hospital and medical costs.

---

[5] Ibid., p. 7.

Property and Liability Insurance Short-Term Forecast

A look at the national property and liability (P&L) industry first is informative because Tennessee's P&L industry is much influenced by the national. The P&L insurance industry generally prospered in 1979, and it is almost certain to have record net income. Most favorable have been the historically high interest rates which have contributed to sharply higher investment income. Net income gains were much reduced compared to 1978, however, and premiums increased probably only about 8 percent. Underwriting losses were heavy and catastrophe losses (which are the total of all claims which exceeded one million dollars each) are expected to be a record $1.6 billion. Inflation in the costs of the items the companies buy, such as medical expenses, auto repair, and housing, was up sharply. Finally, a significant amount of price cutting has been occurring, and this has caused some P&L business to be underpriced.

The P&L industry's underwriting cycle peaked in 1978; it is now well into the down cycle, and 1979's underwriting loss may reach $2 billion. An important question is, "How severe is this down cycle likely to be?" The answer is, in short, not so bad as the last down cycle, which occurred in 1974-75. That one was so severe that it scared some company executives nearly out of their wits, not to mention a number of insurance commissioners. Among the untoward events which occurred then were that the auto insurance combined loss ratio reached 114; medical malpractice claims soared, and many insurers withdrew from this market; the surplus-to-premium ratio was severely eroded by the sharp stock market slump and by huge underwriting losses; company earnings plummeted, though generally they stayed positive because of the contribution of investment income; and one important company, Government Employees Insurance Company, was brought to the brink of insolvency. The severity of the last down cycle can be attributed mostly to the cut-throat competition which preceded it. Memories of this debacle are still fresh, and this should be sufficient to prevent a recurrence in the near future. Another hopeful sign is that companies and regulators are better prepared for high and rising rates of inflation than they were previously.

Expected favorable factors for the industry in 1980-81 are that high gasoline prices and the weak economy will cause people to drive less and to drive more slowly, thus causing fewer and less severe accidents; the life insurance business will make an added and stable income contribution to many companies; the high inflation rate should cause insurance prices to be firmer than they otherwise would be; catastrophe losses are likely to be much lower in 1980-81 than the record 1979 catastrophe losses; badly needed automobile rate increases have been granted in many states, which should make automobile underwriting losses manageable; and high interest rates should make a strong contribution to net income over this period.

Expected unfavorable factors for the 1980-81 period are that inflation will continue at a high rate, though somewhat down from the present level, and premium rate increases will lag other price increases; claims in the medical malpractice area, which have jumped sharply recently, may again become a crisis area; arson losses will rise significantly in the 1980 recession year; and the weak economy and high investment income can be counted on to cause excessive price competition to occur in some P&L markets in 1980-81, causing some business to be underpriced.

In sum, the industry should continue to suffer underwriting losses over the 1980-81 period but these will be balanced by high investment income. P&L industry earnings ought to be flat in 1980, and they should rise about 3 to 5 percent in 1981. Inflation in claims costs for the industry should average about 10 percent per annum, and premiums should rise about 9 percent per annum.

State Insurance Commissioner John Neff recently approved an auto insurance rate increase of 9 percent for Insurance Services Office and an 8½ percent increase for the State Farm Insurance Company. Since automobile insurance accounts for about 42 percent of P&L insurance premiums in Tennessee, these rate increases will contribute significantly to 1980 premium income for companies and commission income for Tennessee agents. On the negative side, Commissioner Neff approved State Farm's recent request for a 4.6 percent reduction in homeowner's rates, and this move may signal heightened price competition for this business.

Tennessee's direct written P&L premiums totaled $1.366 billion in 1978.[6] Because few rate increases were granted in the late 1978 to early 1979 period, premiums for 1979 probably grew only about 7½ percent, to $1.469 billion. For most people, P&L insurance is considered a necessity, and this fact, along with inflation in property values and claims and the recent and forthcoming rate increases, should be sufficient to raise Tennessee's P&L premiums in the 1980 recession year about 8 percent, to $1.586 billion. In 1981, Tennessee P&L premiums are estimated to increase 11.7 percent, which is near the long-term historical growth rate, to a level of $1.771 billion dollars. In short, P&L companies and agents doing business in Tennessee should generally experience relative prosperity over the next two years despite the expected recession.

---

[6] Best's Executive Data Service as cited in Insurance Facts, 1979 edition (New York: Insurance Information Institute), p. 19.

Property and Liability Long-Term Outlook

The property and liability (P&L) industry's underwriting cycle should bottom out sometime in 1980, and improvement should occur in 1981. Nevertheless, the industry can be expected to suffer underwriting losses indefinitely because most (perhaps all) insurance commissioners are now considering the industry's fat investment income when approving rate increases, and the industry itself is considering investment income in its pricing decisions. Despite underwriting losses, the industry should be considerably more profitable during the 1982-85 period as underwriting losses decrease and as demand for the industry's products expands. Sometime after 1985, the industry may again experience a large increase in underwriting losses as its underwriting cycle turns down.

Tennessee's P&L insurance premiums have increased in recent years at about a 12 percent compounded growth rate. The industry has both pluses and minuses, but this is a mature industry and the best bet seems to be that future long-term growth will be much like the past. More specifically, this writer assumes that inflation in the items the P&L industry buys will average 1.5 percent higher than the forecast inflation rate for the rest of the State's economy over the 1982-88 period, and that premiums will grow at this inflation rate plus the State's real forecast growth rate. These assumptions translate into the following P&L premium forecast for Tennessee as shown in Table 12.

Some form of no-fault legislation is likely to be adopted in Tennessee during the 1980's, but the pressure for adoption seems more likely to originate in Washington than in Nashville. No-fault dispenses with faultfinding in all but serious bodily injury automobile accidents. (Damage to one's car also would remain under a fault system.) Proponents of no-fault argue that faultfinding in auto accidents is time-consuming, expensive, and almost ridiculously inaccurate and that many seriously injured accident victims are poorly compensated on a fault system. Opponents argue that pain and suffering losses, for which no-fault provides no compensation, are real losses, and that it is unconstitutional to abridge the right to sue for these and other damages.

In many urban areas of the country, the setting of automobile insurance rates by a merit rating basis has garnered considerable support, and a few states have already adopted some form of it. With a pure merit rating system, automobile insurance rates would be based entirely on a person's driving record, and rate discrimination on such bases as age, marital status, sex, and geographic location would be prohibited. (Any merit rating system adopted will be "modified," not "pure.") Proponents of merit rating argue that

TABLE 12

ESTIMATED DIRECT WRITTEN TENNESSEE P&L INSURANCE PREMIUMS (In Thousands of Dollars)[a]

Year	Premiums	Percent Change From Previous Year
1978	$1,366,158 (actual)	17.30 (actual)
1979	1,468,620	7.50
1980	1,586,109	8.00
1981	1,779,456	12.19
1982	1,990,500	11.86
1983	2,209,853	11.02
1984	2,448,738	10.81
1985	2,708,059	10.59
1986	2,999,717	10.77
1987	3,331,786	11.07
1988	3,701,947	11.11

a. The actual data source is Best's Executive Data Service as cited in Insurance Facts, 1979 ed. (New York: Insurance Information Institute), p. 19. Estimates are the author's.

other systems are unfair for good drivers, say those who are single, male, and under age 25. Moreover, if premium rates are based on age, sex, marital status, and geographical location--factors over which insureds have little control--the automobile insurance rating system provides little incentive for safe driving. Opponents argue that insurers can predict well for a large class of insureds, say all single males under age 25, but they cannot predict well for any single insured, say an unmarried male under age 25. Nevertheless, it is likely that rate discrimination on the basis of age, marital status, and sex will be eliminated in Tennessee sometime in the 1980's, and that the rate structure will "flatten" somewhat.

FIRE Subsector: Real Estate

Real Estate Short-Term Forecast

In 1979 the real estate sector was unique as compared to other sectors of the Tennessee economy. Where one could find argument among economists as to whether we in fact were or were not entering a recession in the manufacturing or nondurable goods sectors, there could be little doubt in the real estate markets. Facing the highest interest rates in Tennessee history, builders were forced to drastically cut back on new housing starts and in many cases builders could find no short-term money at all. From the middle of the summer to the Christmas holidays the real estate commission watched helplessly as the prime increased from just about 10 percent to a record high of 15 3/4 percent. Mortgage rates followed suit, increasing from below 10 percent to as high as 14 percent in some areas. In the month of October alone FHA-guaranteed mortgages increased from 10 percent to 11½ percent, and to exacerbate the situation even more, points increased from the 1-3 point range to as high as 14 points. From July through December points averaged in the 8-point range. This trend may continue in 1980.

To understand the real estate markets in Tennessee, we should first look at the variables that affect the supply and demand of housing. There are four basic variables that will affect the volume of economic activity in real estate markets. These are demographic factors, the level of interest rates, the availability of mortgage money, and consumer expectation.

Demographic factors are important in determining the underlying trend in housing markets, specifically the rate of increase or decrease in the population base of an area; the purchasing power of the population as measured by both the absolute level of income and also by the change, either positive or negative; and the effects of in- or outmigration from rural to urban areas.

In the Tennessee Econometric Model, a moderate growth in the population base for Tennessee is projected. Income levels will continue to increase over the intermediate term at a moderate rate. This indicates an underlying trend for steady demand for new housing. The existing stock of housing should also experience firm demand because of this in-migration to the state. A note of caution is in order, however. Certain areas such as Jackson and Tri-Cities are experiencing much higher than average growth rates. Other areas are much more stagnant. For example, mortgages originating in the Chattanooga area do not reflect the same high level of growth.

If the fourth quarter of 1979 is any guide to the 1980 market, interest rates will be the principal factor determining economic activity in the real estate market. In general, there is an inverse relationship between the rate of interest and the level of activity in the housing market. Rates on mortgage money have increased dramatically, indicating that if those rates remain at the same levels, a reduced demand for housing in general will occur. For example, consider a house that in the Spring of 1979 sold for $50,000 with a thirty-year mortgage at 9½ percent. The monthly payment for principal and interest would be $424.00. That same house selling one year later (assuming a 10 percent appreciation) with a new mortgage at 12½ percent would require a monthly payment of $590.00. This is almost a 40 percent increase in the monthly cost of owning the home.

This produces an interesting situation. A willing seller and a willing buyer, but no sale. The buyer who could have qualified to borrow $50,000 at 9½ percent can no longer qualify to borrow $55,000 at 12½ percent. Therefore, it is seen that at any level of housing services picked, the market has been substantially reduced.

Whether or not current long-term rates will remain at this level over the short run is purely speculative. Rates were allowed to fluctuate to this high level by the Fed as a means of curbing the currently high rates of inflation. If rates do remain at this level, a long (perhaps 2-3 year) adjustment period can be anticipated. However, if rates come down over the first and second quarter of 1980, demand for new and used housing can be expected to increase. In fact, the demand for housing could, over the short term (1980-81), increase to a level above that which would be expected over the long term. This could be triggered by "pent-up" demand by potential frustrated buyers unable to buy during late 1979 and early 1980. As stated, a forecast for 1980-82 is based on many assumptions and depends largely on the actions of the Fed and the Administration.

Mortgage money, although relatively expensive, has been available in Tennessee. In contrast, consider a recent announcement in Chicago that the three largest savings and loan associations had no money at all and that the fourth largest would make loans, but only to the most credit-worthy borrowers and then only for 50 percent of the value of the home.

Assuming that rates decrease and that Tennessee does not experience substantial disintermediation, mortgage money is likely to be available. However, relative to the past several years the supply of money to the industry (both short-term and long-term) is substantially less. As in the case of interest rate levels, the availability of funds is questionable. It appears that funds will be available, however, the current policy of the Administration could have radical effects. In the Tennessee Econometric Model a steady upward trend in housing is forecast. The model is dependent on assumptions relative to federal policy that influence construction and real estate forecasts in the model. Other scenarios could result from alternative assumptions regarding federal policy.

A final variable to be considered in the analysis of the intermediate trend in the real estate industry is consumer expectations. Current federal policy is geared to change expectations of future inflation trends. Historically, housing has been considered one of the best hedges against inflation, particularly for the average consumer. As long as consumers continue to believe that housing prices will increase at least as fast as the rate charged on mortgages, the demand for new construction (as well as for the existing stock of housing) can be expected to remain stable at current levels.

However, if the current federal policy succeeds in breaking this inflationary psychology, a lower level of demand will likely occur.

A likely scenario for housing demand is as follows: over the short run (through the second quarter of 1980) housing demand and prices will remain stable, or in some areas, the two may decrease. This is caused by the factors considered above. By the summer of 1980, with increasing pressure on the Administration, if money becomes more available and at a lower cost, the demand for housing will increase substantially, perhaps even above the expected level, which is based solely on population trends. Not only will the normal demand exist, but so will a backlog of demand from the previous year. This can be expected from the third quarter of 1980 and might continue over the next year. After this a relatively stable demand for housing would be expected. This is only hypothetical, however, depending heavily on the actions of the federal government.

A final comment is in order. Interest rates would not likely have to go back to the 9-10 percent range for this to occur. If consumers expect rates in the longer run to remain at 10-11 percent, they might simply adjust to this new higher rate.

Real Estate Long-Term Forecast

The long-term forecast for the real estate industry in Tennessee is bright. Over the long term, a moderate increase in the housing stock is expected each year. Since the demand for housing, and consequently, the level of activity in the real estate market, is basically dependent on population forces, overall demand in the real estate sector seems stable. However, the real estate sector is perhaps the most volatile sector in our economy. Even though a trend line plotted from 1982-87 will probably be a predictably monotonic increasing function, the year-to-year market in real estate could swing radically. Projections in real estate can necessarily show only overall trends. Assuming a stable economy and assuming a stable predictable government policy, real estate will follow the trends obediently. This predicted stable increase assumes, however, that the current restrictive government policy will be short-lived and that a more stable policy will be followed over the longer run.

CHAPTER 5

TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES

Introduction

Although some cost and operational differences exist within the transportation, communications, and public utilities (TCPU) sector of the economy, there are sufficient common characteristics for it to be considered as a single economic unit for forecast purposes. First, this sector is subject to some economic regulation at most levels of government. The various regulatory agencies have powers that extend to such areas as control of entry and exit, the level and type of rates that can be charged, control of operating expenses, approval of mergers, level of operation, and many other aspects of business that are normally handled by private management.

In addition, with the possible exception of intermodal competition in the transportation segment, the price elasticity of demand is quite low in the TCPU sector. This is because the nature of the service provided by these companies is essential and people are willing (or sometimes forced) to pay significantly higher prices without materially reducing the quantity consumed. Although the choice of different modes of transportation gives the shipper more flexibility than the user of communications and public utility services, this flexibility is limited by regulatory constraints, particularly to the extent that regulatory commissions sometimes disallow rate decreases that will adversely affect other transportation modes.

These characteristics tend to insulate such businesses from extreme economic fluctuations and forecasting is made easier to the extent that regulatory policy is consistent and enlightened.

This latter statement must be tempered by the fact that, within the last two years, air cargo movements (by all cargo carriers) have been completely deregulated and there has been some selective deregulation of the combination air carriers--those that carry both passengers and cargo. There is also being considered in Congress legislation that would selectively deregulate motor carrier and railroad operations. Since the provision of this legislation is uncertain at this time, the forecast becomes less certain. An added factor has been the accusation by some major trade associations that the regulatory agencies have been participating in deregulation by "administrative fiat" in order to avoid emasculation of their organizations. The implications of these factors will be discussed in more detail in the forecast sections.

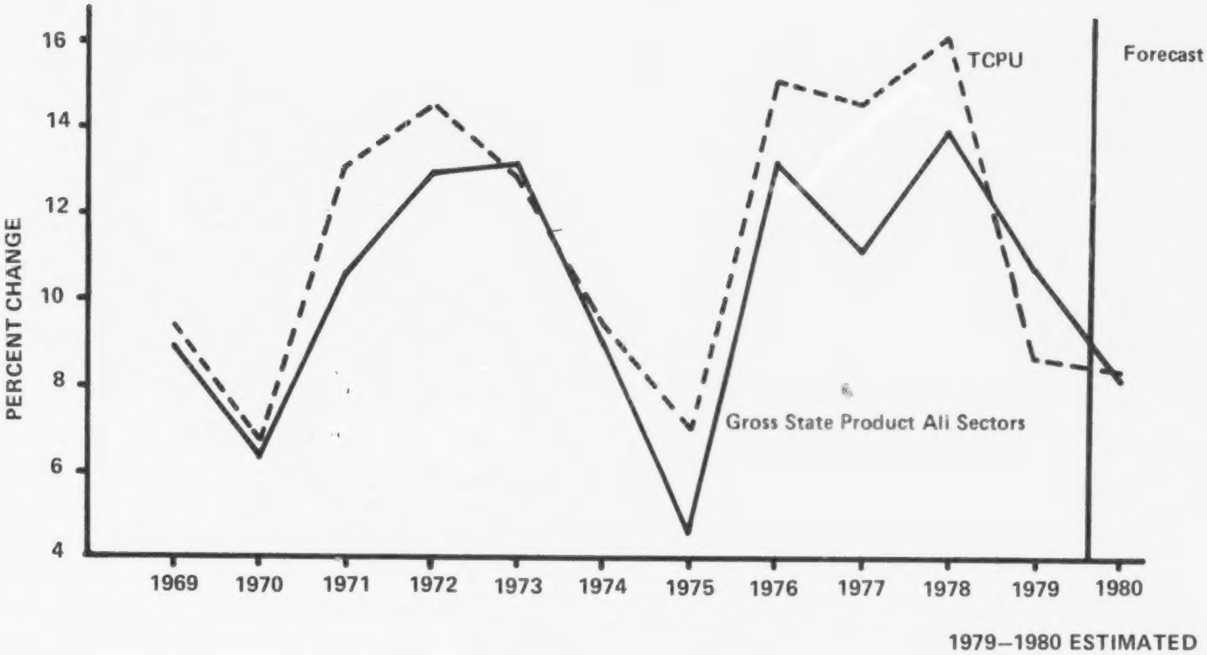
Sector Response to Economic Downturns

In comparing percent changes in gross state product for all sectors with those of the TCPU sector for the years 1969-1980 (Figure 8), it is readily apparent that the swings, while differing somewhat in degree, correlate very well. This correlation is probably due to both political and regulatory policy, particularly during periods of economic downturn when regulators and policymakers are reluctant to grant rate increases to these "essential industries."

When the forecast charts are analyzed (Figures 9, 10, and 11), however, some differences are noted. In Figure 8, which displays

FIGURE 8

PERCENT CHANGES IN CURRENT DOLLAR GROSS STATE PRODUCT AND TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES OUTPUT
1969–1980

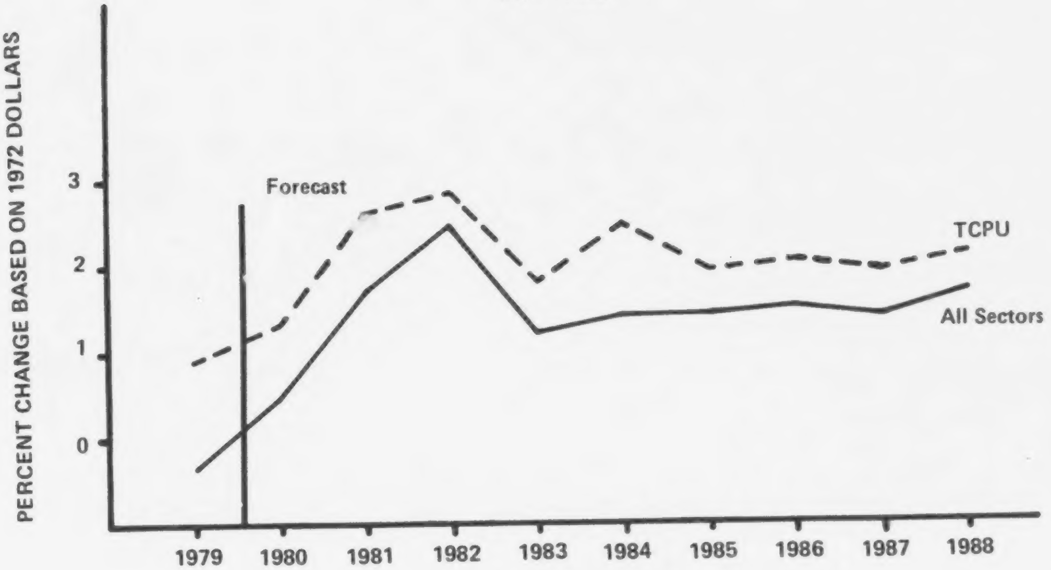


SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 9

AVERAGE ANNUAL WAGE AND SALARY PERCENT CHANGES FOR ALL SECTORS AND TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES

1979–1988

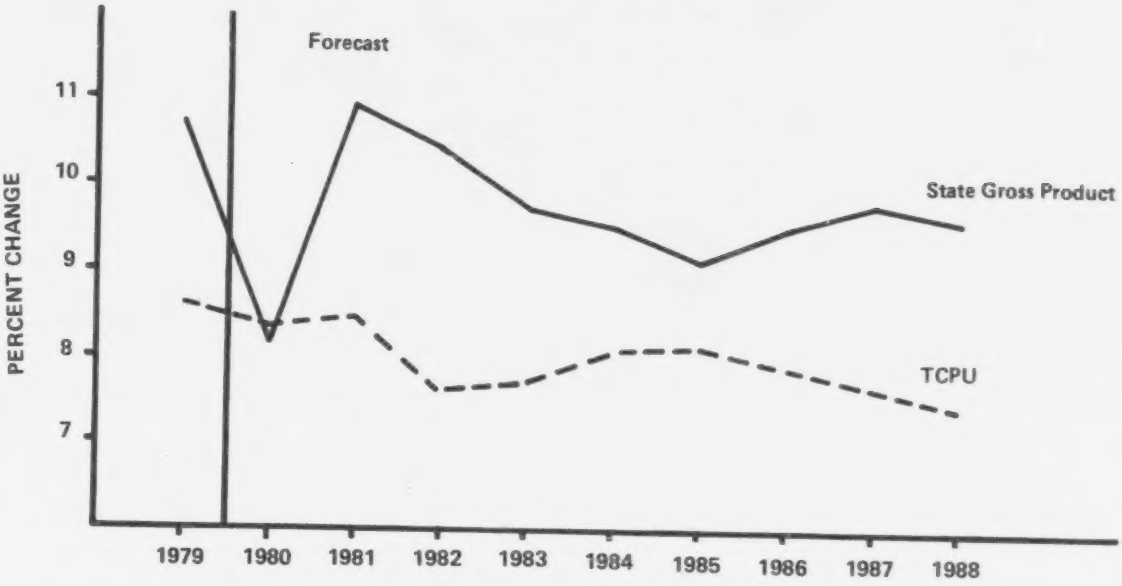


SOURCE: Tennessee Econometric Model, November 15, 1979.

FIGURE 10

CURRENT DOLLAR GROSS STATE PRODUCT AND TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES OUTPUT

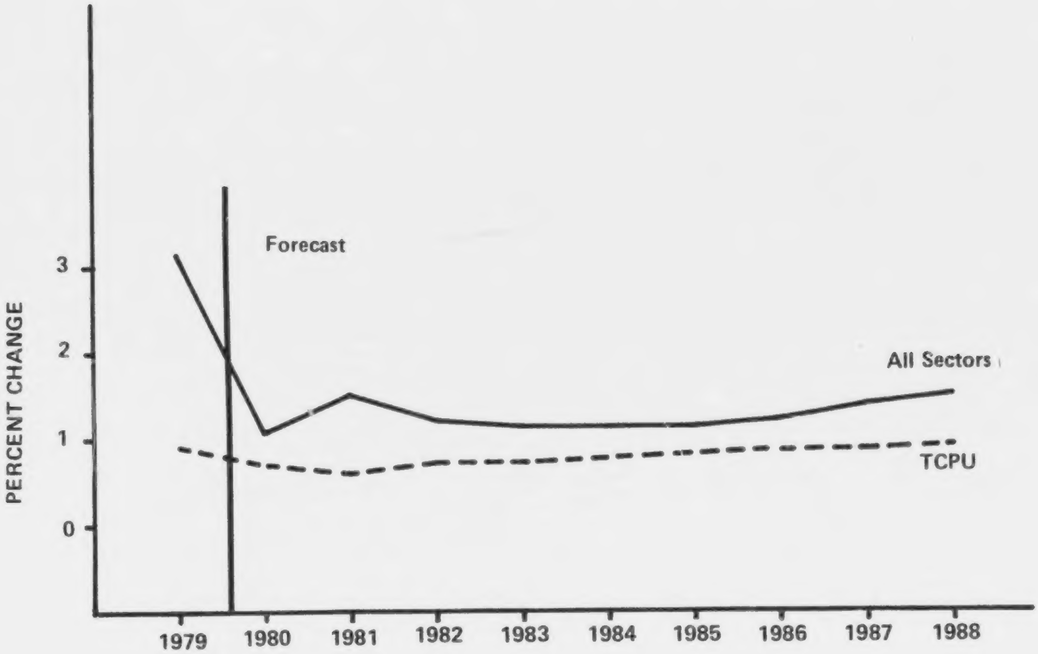
1979–1988



SOURCE: Tennessee Econometric Model, November 15, 1979.

FIGURE 11

EMPLOYMENT PERCENT CHANGES FOR ALL SECTORS AND TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES 1979-1988



SOURCE: Tennessee Econometric Model, November 15, 1979.

average annual wage and salary changes, a good correlation between TCPU wages and the wage aggregate of all sectors is shown, but the TCPU changes are higher for the entire period. This is probably because certain segments of the TCPU sector are not as labor-intensive as most manufacturing and commercial enterprises, which usually means more specialized and more highly paid labor. Even in the motor carrier and commercial air transportation industries, which are more labor intensive, tightly organized labor organizations tend to keep wage and salary rates higher than the national norm. Notable examples are the Teamsters Union and the Airline Pilots Association.

Somewhat more variation in gross state product than in TCPU output is indicated in the State and TCPU gross product forecast, but there is more stability in TCPU with the possibility of a decline in the latter part of the forecast period (Figure 10). In the absence of short-term technological breakthroughs, reduced energy supplies, environmental barriers, and construction time lags in new public utility and transportation facilities make this a fairly reasonable forecast.

In Figure 11 are shown the forecast changes for employment, including the expected 1980 downturn. Again, somewhat more stability is evidenced in the TCPU sector than for all sectors. This seems to correlate with the capital-intensive nature of several segments of the TCPU sector and efforts by those segments that are more labor intensive to substitute capital for labor wherever possible when labor costs increase. Examples would be larger vehicles of all types, automated loading and unloading, intermodal coordination such as trailer on flat car movements and containerized movements by all modes of transportation. If the current deregulation of transportation climate carries over into communications and public utilities, this sector of both the national and the Tennessee economy will become much less stable.

Short-Term Forecast

As can be seen from Figures 8 through 11 and Table 13, there are strong indications of a rather sharp 1979-1980 economic downturn. This is a viable forecast of the future, particularly in view of some rather recent occurrences that specifically relate to the TCPU sector. Except for communications (which has modest energy needs), TCPU is highly dependent on fossil fuels and/or nuclear power. Although the transportation modes vary in their fuel efficiency, their efficiency varies almost inversely with their flexibility in serving the public. Domestic water transportation (a capacity for which Tennessee is blessed) is very fuel efficient but does not have access to as many communities as rail transportation, which is somewhat less fuel efficient than barges but serves more points. Motor carriers serve many more points than water or rail carriers but are less fuel efficient. Commercial air transportation is not a major force in cargo movements but its speed as a passenger carrier partially overcomes its fuel inefficiency expressed in ton miles carried per gallon of fuel.

Intermodal coordination of which goods would travel as far as possible on the most fuel-efficient mode and to destination via a more flexible mode might be a desirable policy to consider.

TABLE 13

TENNESSEE TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES, SELECTED ECONOMIC VARIABLES 1979-1988

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
TCPU Gross State Product (Millions of current dollars)	3,294.4	3,565.1	3,865.2	4,159.2	4,477.8	4,844.0	5,232.9	5,644.2	6,075.2	6,527.1
Percent Change	8.59	8.22	8.42	7.61	7.66	8.18	8.03	7.86	7.64	7.44
TCPU Gross State Product (Millions of 1972 dollars)	2,164.5	2,188.5	2,221.4	2,259.2	2,301.1	2,345.8	2,394.9	2,446.6	2,501.1	2,560.6
Percent Change	1.32	1.11	1.50	1.70	1.85	1.94	2.10	2.16	2.23	2.38
TCPU Employment (Thousands)	82.9	83.4	83.9	84.5	85.0	85.6	86.3	87.0	87.7	88.5
Percent Change	0.93	0.65	0.61	0.64	0.68	0.72	0.77	0.81	0.84	0.88
TCPU Average Annual Wage and Salary (Current dollars)	17,400	19,148	21,051	23,142	25,077	27,162	29,366	31,759	34,267	36,973
Percent change	10.16	10.04	9.94	9.94	8.36	8.31	8.11	8.15	7.90	7.9
TCPU Average Annual Wage and Salary (1972 dollars)	10,629	10,769	11,050	11,361	11,572	11,810	12,045	12,286	12,524	12,798
Percent Change	0.94	1.32	2.61	2.81	1.86	2.05	1.99	2.00	1.94	2.18

SOURCE: Tennessee Econometric Model, November 15, 1979.

In any case, the short-term petro fuel outlook for the country and Tennessee is rather bleak. This country has stopped purchasing from Iran. It is estimated that the current Middle-Eastern crisis could result in a 10 percent reduction of oil imports and on December 17, 1979, the OPEC nations met in Venezuela to consider another price increase.

For these reasons, President Carter has recommended licensing seven new nuclear power plants by May 1980. One of these is the Sequoyah facility near Chattanooga, which is almost ready to go on-line. It has been estimated that the United States is importing an extra 100,000 barrels of oil per day because of the freeze on licensing the seven nuclear plants.

The Tennessee Valley Authority estimated that it burned 220 million gallons less oil in 1979 than in 1978 and that putting the Sequoyah nuclear plant on-line will save even more oil. This oil is used to meet peak-load demands when other energy-producing sources cannot.

Another factor that can alter the short-term TCPU forecast is the fact that TVA closed the Tellico Dam in December 1979, and the lake is now backing up. When the canal that connects Tellico with Fort Loudon Lake is opened, Loudon's hydroelectric generating capacity will be increased. While the percentage increase of TVA's total capacity will not be large, the increase is estimated to be sufficient to heat 20,000 additional homes.

A factor that might reinforce the TCPU forecast downturn for 1979-1980 is an Energy Department proposal made Friday, December 7 for a standby gasoline rationing plan that would allocate available supplies among states in proportion to their past gasoline consumption. The plan, if approved, could be activated by the president when a national shortage of at least 20 percent occurred and was expected to last for at least 30 days. This would probably mean at least a 30 percent cutback because of reserves that would be established for later discretionary distribution. The plan did not mention allocations for commercial and common carrier transportation. Such a plan, if implemented, should increase participation in public transportation programs that Tennessee has been promoting with federal participation. Such programs include ride-sharing, vanpooling, demand-responsive transportation, and the experimental use of electric vehicles.

Long-Term Forecast

In Figure 8 a downturn is indicated for 1982-83 in wages and salaries for all sectors and TCPU, while in Figure 9 is shown a gradual decline in current dollar gross state product from 1981 to 1985 and somewhat similar trends for TCPU, except for modest increases in 1983-85. The forecast does not look bright. There are several factors that are involved. With population stabilizing and shortages in certain critical resources, it becomes difficult to maintain productivity, particularly in regulated industries.

Earlier mention was made of deregulation by administrative fiat. This simply means that some regulatory agencies [most notably the Interstate Commerce Commission (ICC)] have been changing long-standing policies which have the effect of deregulation, while at the same time Congress is trying to formulate deregulation legislation.

Some of these policies can have a long-term impact on the transportation industry.

For instance, the ICC is considering giving permission to allow intercorporate hauling by company fleets if there is 80 percent ownership of one company by the other. Even though there is potential for increased efficiency, the American Trucking Association (ATA) opposes it on the basis that it is discriminatory. Another example is the ICC consideration of giving private truckers (who can carry only their own products or exempt commodities) operating authority to carry non-exempt commodities in order to avoid empty backhauls. This, too, is being opposed by the ATA.

However, the most profound long-term effects on transportation seem to lie in two areas: (1) the development of alternative energy sources that will release additional supplies of petro fuel to the transportation industry, and (2) the timing and extent of deregulation measures at both the federal and state levels.

In terms of the public utility segment of the TCPU sector, the Tennessee Valley Authority is by far the most influential factor since it produces most of the power for the State, sells part of it directly to large industrial users and the rest to local utility companies for commercial and residential resale. While TVA employment is not considered as part of the TCPU total and within the model it is extended as part of the federal government total, TVA's influence is perverse. It recommends the rate schedules used for power resale. For years the Southeast generally, and the Tennessee Valley area in particular, has continually increased its demand for electricity at a higher rate than other parts of the country. Now these areas (and others) are being asked to curtail this demand until additional capacity can be built. But additional capacity is expensive, as are alternative measures to conserve the use of electricity; thus rates keep going up.

Members of a special State legislative committee are currently trying to see if there are reasons other than inflation for the spiraling power rates. There is some concern that high industrial power rates might be causing companies to leave Tennessee (one is currently planning to, allegedly for this reason) or keeping new companies out. There is also some evidence that some utilities are selling power to industrial users at lower rates than TVA charges.

The TVA industrial rates, however, are generally influenced by coal prices and interest rates. It was pointed out that coal prices have increased 657 percent in the past 10 years and interest rates have escalated. TVA has noted that raw energy materials and interest rates account for 69 percent of each dollar spent in the power program.

On a brighter note, TVA is working with local utilities and on its own to develop long-term innovations and/or concepts that might make the long-run forecast inaccurate for the latter part of the period. The board of directors is currently considering a multi-million dollar long-term alternate energy program for such things as solar office and low-cost solar residental structures, fuel cells that generate electricity, nuclear plant simulators, and renovation and improvement of substandard power-producing equipment. To the extent that these expenditures make positive contributions to increased power production at lower unit cost, the long-run TCPU forecast will have been too modest.

Finally, TVA is conducting a study to determine how new types of rate structures would affect consumers. Public meetings and workshops will be held during the early months of 1980. Although a number of rate concepts are being studied, those being given most serious attention are (1) cost of service rates based completely on the cost of providing the service; (2) interruptible rates which allow lower rates for customers who agree to do without power during peak-use periods (this type of rate is normally for industrial users); (3) seasonal rates which are adjusted seasonally based on cost of production; and (4) time-of-day rates which vary with daily peak power load requirements.

It is interesting to note that, since electricity is a nonstorable product, smoothing out the peaks and troughs of power demand has always been a problem. To the extent that the public will accept rate structures that do this, power costs may go down. Since frequently the residential power consumer does not know when or how much power he is using, many local utilities are experimenting with new types of meters that give easily understandable digital readouts and relate the rate of consumption to the price being charged. This approach may also reduce the demand and cost of electricity.

The communications segment of TCPU consists primarily of the intrastate telecommunications industry, regulated primarily by the Tennessee Public Service Commission. The major company is South Central Bell, although there are a number of independent phone companies within the State. The Federal Communications Commission regulates the interstate--toll service, wide-area telephone service, etc. For this reason, valuation figures must be kept for the property and proportion used in intra- vs. interstate so the rates and service can be regulated accordingly.

Since overall demand has been increasing at a decreasing rate in recent years, the industry has become more market-oriented, keeping up with population shifts, penetrating nonsaturated markets, and developing new and more sophisticated service and equipment.

There has been some concern among top level consumer advocates that the Bell system charges too much for its equipment, has a tendency to overbill, asks for unjustified rate increases, and is often guilty of providing poor service. To the extent that such complaints result in more restrictive regulation, profits could be affected somewhat, but the performance of this segment of TCPU should exceed the forecast. The Tennessee Public Service Commission and South Central Bell appear to have worked on a good faith basis to the benefit of the consumer.

State Policy Perspectives

What should be the policy stance of the State regarding the rather gloomy TCPU forecast? It should be noted that the forecast in the private sector is coupled with some problems in the public sector. Revenue collections have been behind forecasts for this year. Gasoline tax receipts have fallen off 10 percent since July 1, compared with the same period in 1978. This alone could affect the Tennessee highway program, which in turn, would adversely affect the motor carriers.

The two agencies mainly concerned with the Tennessee TCPU sector are the Tennessee Public Service Commission, which regulates rates, routes, and service for intrastate facilities in the sector and the State Department of Transportation, which is responsible for policy formulation, planning, and the administration of certain types of construction projects. The State Revenue Department has a transportation revenue collection function but does not normally involve itself in State transportation policy.

These agencies, TVA, and appropriate development districts will need to consider the following:

(1) Tennessee is one of a few states that has not adopted the federally recommended 80,000-pound load limit for trucks. This means that many interstate movements are "under-loaded" in Tennessee. If possible, the shippers may simply avoid shipping through the State. This is ineffecient, costly, and reduces the level of service. Nevertheless, cost-saving benefits must be considered relative to the added costs of road degradation which would accompany a uniform regional weight law

(2) Tennessee must consider "double-bottom" or tandem trailers. These units are more flexible, have fuel-saving potential, and continued nonapproval of these units causes some motor carrier movements to avoid the State. The units will hasten road-wear. Analysis will be necessary to determine whether costs or benefits are greater

(3) Tennessee has an outstanding waterway system that connects it with most of the other systems in the country. Now may be the time to have an aggressive marketing program for riverport development. The Tennessee Department of Transportation sponsored such a demonstration project in 1978 and the results were encouraging

(4) The State should consider offering continuing support of the Federal Airport-Airway Development Act which is up for revision and extension in 1980. There are many things that need to be done in order to round out a well developed airport system in Tennessee. These efforts should be coupled with efforts to secure better airline service from Tennessee to other cities

(5) The public utilities should be encouraged to continue energy conservation and innovative pricing systems in order to reduce both consumption and cost. The rate to which the recent encouraging trend toward nuclear plants will affect consumption, cost, and safety will have to be considered carefully.

CHAPTER 6

TRADE AND SERVICES

Short-Term Analysis

The year 1979 has been a disappointing year for the nation's merchants. Some curtailment of consumer expenditures was inevitable in 1979 after the spending splurge during the final quarter of 1978. The frenzied buying in that period represented, at least in part, a hedge against inflation, e.g., the inclination to pay a high price now rather than a higher price later. Based on the latest 1979 retail sales figures, dollar volume is up about 12 percent over 1978. Since the price index for retail products has risen by roughly the same magnitude, the movement of merchandise is duplicating the 1978 movement.

The effect of inflation is inequitable in that prices for some goods and services have risen faster than others and the price increases affect different income groups to different degrees. Health care has been the single most inflationary item in the consumer's budget, rising over 60 percent in the past five years. During the same time, the daily rate for a hospital room went up 90 percent and a visit to the family physician increased 67 percent. In health care, only prescription drug prices advanced at a lower rate than the overall inflation.

Inflation in the supermarket is a particularly sensitive issue. First, food accounts for a significant proportion of the average family's budget. Second, food accounts for more of the family's budget, the lower the income level; for low income groups, 34.2 percent of the pretax income is spent on food. Finally, since shopping for groceries is a frequent event, consumers are quick to notice and react to frequent and large price increases.

It has been surprising that the recent strength in retail sales developed despite the twin undermining influences of inflation and downturn. Real disposable income has continued to decline since 1972, so the summer sales upturn drove the savings rate down to 4.1 percent, a 29-year low. The Conference Board Consumer Confidence Index dropped every month in 1979 through August and rebounded slightly in September to 76.5, which is still considerably less than the 94.0 index held in January 1979. The "expectational component" of the Conference Board Index, which is based on questions concerning the consumers' view of future business and employment conditions, as well as the likely future of their own fortunes, is lower than it has been in five years. However, this low index has not yet caused consumers to increase savings substantially. In the trough of the last recession (1973-75), the savings rate soared almost to 10 percent and it had been at more than 8 percent at the bottom of the trough of the recession (1969-1970) before that. A return to these savings rates would have a substantial effect; for example, a shift only to a 7 percent rate of saving would slice $45 billion from consumer markets. With expectations of continuing inflation, sharp increases in Social Security taxes and growing unemployment, consumers will experience both real and psychological pressures that will modify their purchase patterns, particularly those made with discretionary income.

Trade Forecast through 1981

The predicted performance of the Tennessee retailing sector for the next two years is given in Table 14 along with the actual performance for 1978 and the estimated performance for 1979. Note that forecasts in current dollars reflect the levels of anticipated inflation as well as real growth, while the forecasts in 1972 dollars indicate real growth only. Thus, a rough approximation of inflation in the trade sector for any period can be obtained by subtracting the percent change in real dollars from that for current dollars.

With a strong fourth quarter, retail sales in Tennessee for 1979 will be approximately 8.9 percent higher than in 1978. By far the largest growth will be for the nonautomobile sector, which is expected to be 11.5 percent higher than last year. Thus the state government will benefit from increasing revenues from sales tax, although the increase in sales tax revenues during 1979 had difficulty matching the inflation in goods and services which were purchased. As can be seen in Table 14, retail sales in real terms will decrease in 1979 for the State as a whole.

The major disappointment in 1979 is in automobile sales. By any standard, it has been a difficult year for America's auto industry. First, the gasoline lines in the spring, spawned by upheaval in Iran and a sagging economy at home turned the traditional good weather sales boom to a bust. Next, mounting stockpiles of unsold cars led to huge summer price-cutting campaigns which ate into future sales. Consumer nervousness over future gasoline supplies and prices, heightened by the hostage crisis in Iran, led consumers to shun the 1980 models, which tend on average to be larger cars than

TABLE 14

RECENT AND SHORT-TERM TENNESSEE RETAIL SALES

	1978	1979	1980	1981
Retail Sales (Millions of current dollars)	15,712.2	17,107.3	18,337.7	20,481.3
Percent Change	10.2	8.9	7.2	11.7
Automobile Sales	3,628.7	3,638.4	3,809.8	4,416.5
Percent Change	13.6	0.3	4.7	15.9
Nonautomobile Sales	12,083.5	13,468.9	14,527.9	16,064.7
Percent Change	9.2	11.5	7.9	10.6
Retail Sales (Millions of 1972 dollars)	10,474.8	10,450.4	10,313.7	10,751.3
Percent Change	3.2	-0.2	-1.3	4.2
Automobile Sales	2,419.1	2,222.6	2,142.8	2,318.4
Percent Change	6.3	-8.1	-3.6	8.2
Nonautomobile Sales	8,055.7	8,227.8	8,170.9	8,432.9
Percent Change	2.2	2.1	-0.7	3.2

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

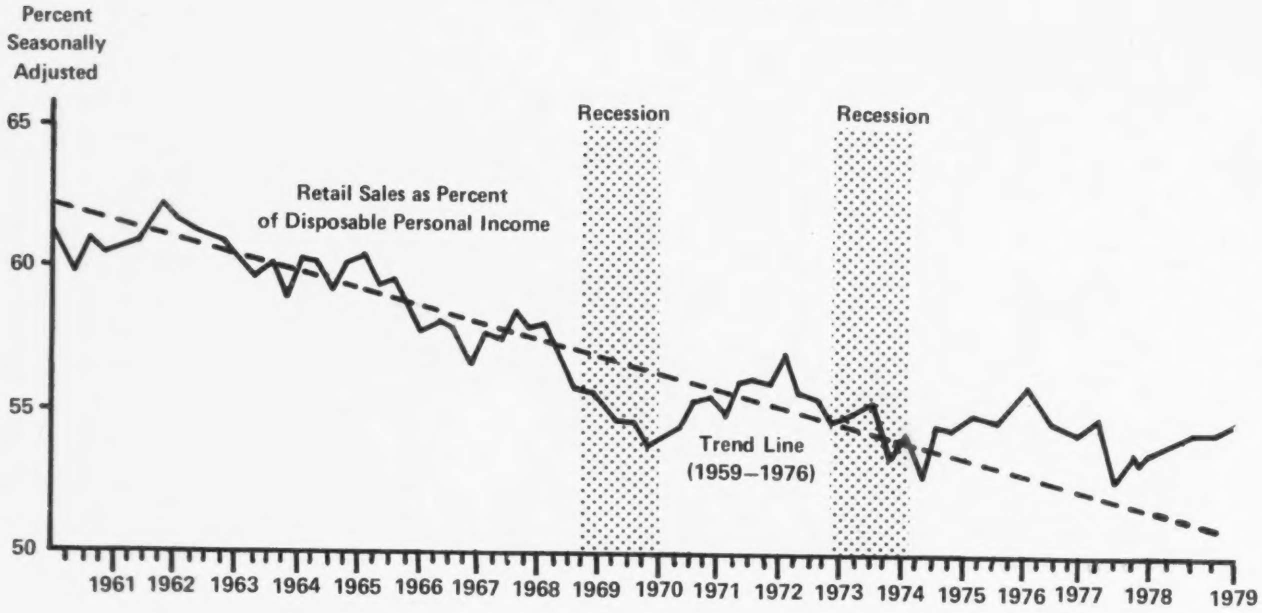
those produced in 1979. Many consumers realize their credit is stretched too tight and are avoiding showrooms. One-fourth of those who do come in are unable to get financing. Also, business purchases of fleet cars are waning. For example, at General Motors' Chevrolet division, fall fleet sales are down 40 percent from last year and are not much above the levels purchased during the last recession. Even demand for the small, fuel-efficient cars is softening with November inventories holding at 90 days of potential sales instead of the industry norm of 60.

For 1980 the projections are not sanguine, as retail sales, in real terms, are expected to be less than in 1979. As in 1979, automobile sales will be a continued disappointment. Consequently, the number of automobile workers laid off will probably increase above the current level of 100,000 but hopefully will not reach the 200,000 plus who were idled at the nadir of the last slump. The reduction in automobile sales has had a major ripple effect through the country. During the model year which ended September 30, 1979, 468 domestic-make dealers closed their showrooms, affecting the biggest companies since eight of the ten largest manufacturing companies in the Fortune 500 either build vehicles or supply them with fuel. More than 13 million Americans make their living producing, distributing, selling, maintaining, repairing, fueling, junking, and driving motor vehicles. Consumers devote about 13 percent of their total spending to transportation, and most of this is for motor vehicles. The nation's system for distributing goods is built around trucks. Certainly the U.S. government and business are confronting an extraordinary spate of uncertainties at this time, many of which are beyond our borders and seem beyond our control. Assuming reasonable solutions to these uncertainties, including a continued supply of oil at real prices not much above the recently increased level, 1981 should bring a return to more prosperous times. In real terms, automobile sales should rebound strongly with 8.2 percent growth while the nonautomobile component will move upward with a 3.2 percent rate. Inflation, as measured by the difference between rates in current dollars and 1972 dollars, will be high by long-term historical standards but less than the recent inflation rate. The expanding economy will generate a substantial increase in government revenues from the sales tax on retail goods.

For both 1979 and 1980, retail sales are expected to lag the gains in disposable or after-tax income. In 1979 disposable income is expected to increase by 11.3 percent compared to 8.9 percent for retail sales. Corresponding figures for 1980 are 10.0 percent for disposable income and 7.2 percent for retail sales. Thus, as disposable income increases over the next two years, so will retail sales, but the proportion of earnings passing over the retail counter will be less than this year. This phenomenon of retail sales growing less than disposable income is a long-term U.S. trend, as is evident in Figure 12. Note that the trend line for retail sales as a percent of disposable income has been decreasing from approximately 63 percent in 1959. During the 1968-69 recession, the ratio dropped considerably below the trend line but then rose rapidly as the economy expanded. Then, as the 1973-74 recession approached, the ratio again dropped considerably. Since the last recession, the ratio of retail sales to disposable income has exceeded the long-term trend

FIGURE 12

DISPOSABLE PERSONAL INCOME AND SALES



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business.*

line. However, since the fourth quarter of 1978, when the ratio was 54.9, the ratio has dropped every quarter and the third quarter 1979 estimate, based on preliminary statistics released by the federal government, was 53.2. Whether or not the ratio will drop to the trend line during the current recession remains to be seen.

It is important to recognize that the decreasing trend line in Figure 12 does not imply that Americans are consuming less. In 1960 Americans spent 93.0 percent of their disposable income on personal consumption. In 1978 the ratio was 92.6 percent. Instead the trend line suggests that since 1960 retail goods have become relatively less important as increasing incomes outpaced inflation and/or Americans opted for services such as improved health care, which does not pass through retail cash registers.

Tennessee has not experienced the same trend as that displayed in Figure 12. In the last ten years, for example, the ratio of Tennessee retail sales to disposable income has generally been above 60 percent. The 1979 ratio is 60.3 percent. The high consumption rate is probably a result of the fact that Tennessee residents have a lower income than does the average U.S. resident. Thus, a larger percentage of the Tennessee resident's income is required for food and other necessary retail products. As the income gap between Tennessee and U.S. residents narrows, it is likely that the ratio of retail sales to disposable income for Tennessee residents will be closer to that for the U.S. in general.

A continuance of the trend line in Figure 12 seems to be doubtful at this time since disposable income gains are not matching the price increases in retail goods. Thus, for the trend line to continue, the consumer must be willing to accept a combination of retail goods with less quality and/or quantity or alter his consumption in some other manner.

Retailers also need to be alert to changes in the American lifestyle and consumer purchasing preferences. Between the early 1960's and the early 1970's, there were significant shifts in the way Americans spent their consuming dollars. For example, in the early 1960's, 19.6 percent of the household budget was spent on food at home, but in the early 1970's this was reduced to 14.0 percent. Compared to the early 1970's, the consumer today spends more for housing, food away from home, transportation, and recreation. In Table 15 there are comparative data on the composition of real personal consumption expenditures for 1960, 1970, and 1980. Durable goods and services have become a larger percent of the total at the expense of nondurable goods, particularly food and beverages. Thus, individual sectors of the retailing business community will experience rates of growth different than those forecast in Table 15 as consumers continue to alter their consumption patterns in the next two years.

Services Forecast through 1981

For many years, services have been claiming an increasing share of the average U.S. family's total budget. During the 1950's, the services sector's share of the budget rose from 35 to 40 percent. By 1970, the share for services exceeded 44 percent. In recent years the rate of growth has continued but at a reduced rate, as can be seen in Table 15, in which is forecast a 1980 share of 47.1 percent for the entire U.S.

TABLE 15

COMPOSITION OF REAL PERSONAL CONSUMPTION EXPENDITURES IN THE UNITED STATES, 1960, 1970, AND 1980

Item	1960	1970	1980
Durable Goods	11.6	13.3	15.5
Autos and Parts	5.6	5.5	6.1
Furniture and Other Household Operating Equipment	4.3	5.6	6.8
Other Durable Goods	1.6	2.1	2.6
Nondurable Goods	46.0	42.3	37.3
Food and Beverages	25.5	22.0	17.9
Clothing and Shoes	8.1	7.4	8.4
Gasoline and Oil	3.1	3.4	2.9
Other Nondurable Goods	9.2	9.5	8.1
Services	42.5	44.4	47.1
Housing	14.1	15.3	17.7
Household Operating Services	6.1	6.4	6.7
Transportation Services	3.7	3.6	3.8
Other Services	18.5	19.2	18.8

SOURCE: Wharton Econometric Forecasting Associates, Inc., Historical Data and Pre-meeting Control Solution, September 24, 1979.

The 1980 and 1981 forecasts for services are presented in Table 16. Real growth for the services sector is forecast to be 1.1 percent in 1980 and 2.7 percent in 1981, which is less than the amount realized in each of the last four years. Along with this low growth rate will be some increases in employment. According to data in Table 17, an employment increase of 2.8 percent for 1980 will be followed by an increase of 2.5 percent for 1981.

Long-Term Analysis

While 1979 retail trade and service gains have been pleasant surprises to merchants in these sectors, the strength of 1979 may lead to greater disappointments in 1980 and beyond. In trying to assess the future of the trade and services sectors in the 1980's, it is important for businessmen to keep in mind that over relatively short periods of time, there are extensive changes in the factors which determine how families spend their money. One factor is, of course, inflation. While prices for almost all goods and services rose substantially in the 1970's, they rose faster for some items than for others. For example, in recent years the rise in prices for durable goods has been less than average, while the rise for services has been substantially larger. Taxes are another dimension to inflation. During the 1973-78 period, the typical family of four experienced an 83 percent increase in their tax obligation but only a 45 percent increase in earnings. In view of the inflation between 1973 and 1978, the Bureau of Labor reports that a typical family of four had to increase their income from $18,200 in 1973 to $27,500 in 1978 to enjoy a reasonably "comfortable" standard of living.

TABLE 16

TENNESSEE GROSS STATE PRODUCT BY SECTOR, 1978-1981
(Millions of 1972 Dollars)

Sector	1978	1979	1980	1981
Gross State Product	25,968.6	26,470.1	26,462.5	27,399.3
Percent Change	6.2	1.9	-0.0	3.5
Trade	4,224.8	4,315.0	4,358.8	4,511.9
Percent Change	4.9	2.1	1.0	3.7
Services	2,758.1	2,853.3	2,883.2	2,961.4
Percent Change	8.8	3.5	1.1	2.7
Per Capita Gross State Product (1972 dollars)	5,960.	6,017.	5,966.	6,133.
Percent Change	4.6	1.0	-0.9	2.8

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

TABLE 17

TENNESSEE EMPLOYMENT BY SECTOR, 1978-1981
(Thousands)

Sector	1978	1979	1980	1981
Nonagricultural Jobs	1,708.3	1,732.6	1,738.9	1,763.7
Percent Change	4.9	1.4	0.4	1.4
Trade	369.0	372.8	370.4	371.7
Percent Change	5.5	1.0	-0.7	0.4
Services	263.8	273.7	281.2	288.2
Percent Change	5.3	3.7	2.8	2.5
Total Employment (Persons)	1,815.0	1,870.8	1,891.9	1,921.1
Percent Change	1.8	3.1	1.1	1.5
Unemployment (Persons)	111.0	118.4	144.3	141.7
Percent Change	-7.5	6.7	21.9	-1.8
Unemployment Rate (Percent)	5.8	6.0	7.1	6.9
Civilian Labor Force (Persons)	1,926.0	1,989.2	2,036.1	2,062.7
Percent Change	1.2	3.3	2.4	1.3

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

have more disposable income. This appears to be a good scenario for washers, dryers, stoves, TV's, stereos, etc. But looking beyond the obvious is most interesting. For a long time the trend has been to bigger and more elaborate appliances and entertainment equipment. If the cost per square foot of housing and energy continues to increase faster than prices in general, will stripped-down, smaller models become the fad? Another trend is for younger people to sleep in their housing but not really live there. Will higher energy costs keep residents closer to home, thereby increasing the demand for home entertainment products? Will the quest for quality become more of a guiding principle for cost-conscious shoppers who increasingly recognize they cannot afford to call the serviceman?

New households suggest a need for additional vehicles. Indeed, the large increases in household formations during the 1970's undoubtedly raised the number of households requiring cars. However, since the growth rate of cars alone during the early 1970's was almost twice that of total households, household formation cannot explain the explosive growth in vehicle population in the last decade. In fact, it is hard to explain both the universality and the intensity of the desire to own and use private vehicles without referring to some type of psychological motivation, as well as referring to the need for an effective means of movement. Thus it is necessary to analyze intangible aspects of vehicle ownership among potential buyers to gauge the shape and size of the future vehicle market.

As these few examples illustrate, there are a number of structural changes in the consumer sector that are particularly auspicious for future economic growth but which suggest there will be unequal rates of growth for the various segments of the market. Those changes have been in process for some time. Further insight into the changes in composition of personal consumption expenditures over time is provided in Table 18. Nondurable goods, as a percentage of the total spending by consumers, has been steadily decreasing for many years and is expected to decrease further in the 1980's. Of the major nondurable purchases, the greatest decrease is for food and beverages, which will fall to 17.4 percent in 1985. For the next few years, the major growth, according to Table 15, will be for the auto and parts component of durable goods and the housing component of services.

Trade Forecast through 1988

The confidence which many forecasters hold for the U.S. economy during the next eight years is corroborated in the Tennessee Econometric Model long-term trade sector forecast. As can be seen from the data in Table 19, Tennessee can expect an average annual real growth in retail sales of 3.1 percent for the 1980-84 period and a slightly lower growth (2.9 percent) for the next four years beginning in 1984.

After disappointing sales in 1979 and 1980, vehicle sales should rebound and grow steadily for the next eight years and at a pace slightly ahead of the growth expected in retail sales in general. This, of course, assumes a continuous supply of gasoline and gasoline price increases not too much larger than inflation overall. Further, this assumes our society will not object to further increases in the automobile population which, even since 1973, has grown faster than population and household formation. At the present time, approximately 80 percent of new cars and 50

TABLE 18

COMPOSITION OF REAL PERSONAL CONSUMPTION EXPENDITURES, 1975, 1980, AND 1985

Expenditure	Percent 1975	1980	1985
Durable Goods	14.5	15.5	16.0
Autos and Parts	5.8	6.1	6.6
Furniture and Other Household Operating Equipment	6.4	6.8	6.7
Other Durable Goods	2.3	2.6	2.7
Nondurable Goods	39.6	37.3	35.7
Food and Beverages	19.6	17.9	17.4
Clothing and Shoes	7.9	8.4	8.2
Gasoline and Oil	3.2	2.9	2.3
Other Nondurable Goods	8.9	8.1	7.8
Services	45.9	47.1	48.3
Housing	16.6	17.7	18.6
Household Operating Services	6.5	6.7	6.9
Transportation Services	3.7	3.8	3.8
Other Services	19.0	18.8	19.1

SOURCE: Wharton Econometric Forecasting Associates, Inc., Historical Data and Pre-meeting Control Solution, September 24, 1979.

TABLE 19

TENNESSEE RETAIL SALES
1980, 1984, AND 1988

Item	1980	Average Annual Percent Change 1980-1984	1984	Average Annual Percent Change 1984-1988	1988
Total (Millions of current dollars)	18,337.7	9.9	26,753.9	9.0	37,733.1
Automobile	3,809.8	10.9	5,759.5	9.1	8,174.5
Nonautomobile	14,527.9	9.6	20,994.4	8.9	29,558.6
Total (Millions of 1972 dollars)	10,313.7	3.1	11,632.1	2.9	13,061.0
Automobile	2,142.8	4.0	2,504.1	3.1	2,829.5
Nonautomobile	8,170.9	2.8	9,128.0	2.9	10,231.4

SOURCE: Tennessee Econometric Model, November 15, 1979.

percent of new trucks are used to replace old ones. Thus it would require some remarkable acceleration in obsolescence to raise the scrap or removal percentage enough to halt the upward march of total vehicle population.

Obsolescence would be accelerated if a severe gasoline shortage brings a stringent rationing or a very large increase in prices, since owners of older cars getting poor fuel economy might trade these vehicles in more readily. However, some owners may reduce their mileage so the average miles per year for each car may drop below the current 9,400 level for U.S. cars. Obviously there is plenty of opportunity for miles driven per year to decrease, since 78 percent of all workers commute by car every day, 85 percent of all intercity travel is by car, and Americans average 2.2 car trips per day per person. If the number of miles per car decreased substantially, then fewer owners would hurry to replace their current cars. In this event, a heavy license tax on heavy gas-using automobiles might accomplish the same result.

Again referring to Table 19, the long-term future for the non-automobile segment is also very favorable. In real terms, the average annual growth rate of 2.8 percent for the 1980-84 period will be followed by a similar growth rate for the 1984-88 period. Demographics have been most favorable for the home furnishings market in recent years and will continue to be so. To date, only a portion of the baby-boom youngsters have reached the age to form households.

Comparing the average annual growth rates of retail sales in real and current dollar terms, it can be seen that the retail sector will have an average annual inflation rate of approximately 6.7 percent during the 1980-84 period and an average annual 5.9 percent inflation rate for the 1984-88 period. Although these inflation rates are discomforting to the Tennessee consumer, they are, in fact, less than that experienced last year.

The trade sector is compared to other parts of the Tennessee economy for the 1980-84 and 1984-88 periods in Table 20. As can be seen in that table, the trade ouput will experience growth similar to the overall State economy or gross state product. The growth rate in trade employment will be less than half of that for total employment during 1980-84. Employment opportunities for the 1984-88 period will be better in retailing than in the overall State economy. However, the increases in wages and salaries will be less than those expected for the State economy as a whole.

Services Forecast through 1988

As indicated in Table 18, services have been increasing in their relative importance in personal consumption expenditures since 1965 and will continue to do so through 1988. The growth in the relative share of services is generally related to the rise in the per capita income of the population. The services category currently experiencing the most dramatic increase in relative importance is "other services," which includes such items as medical services, housing services, legal services, and entertainment.

According to analysis of data from the Tennessee Econometric Model, the services sector will experience modest growth for the next four years. Real services output will increase by only 2.3 percent annually on the average. This slight growth in output will generate an average of 2.3 percent more jobs each year through

TABLE 20

AVERAGE ANNUAL PERCENT CHANGE IN REAL GROWTH TRADE AND SERVICES SECTORS

Item	Average Annual Percent Change in Real Growth	
	1980-1984	1984-1988
Gross State Product	3.0	3.3
Trade Output	3.0	3.1
Services Output	2.3	2.8
Total Employment	1.3	1.3
Trade Jobs	0.6	1.5
Services Jobs	2.3	2.2
Total Average Annual Wage and Salary	1.6	1.5
Trade Average Annual Wage and Salary	1.5	1.2
Services Average Annual Wage and Salary	1.0	1.0
Disposable Income	2.7	3.2
Per Capita Disposable Income	1.9	2.3

SOURCE: Tennessee Econometric Model, November 15, 1979.

1984. Beginning in 1984, the outlook for increases in the services sector is again moderate, with an average annual increase of 2.8 percent expected through 1988. The growth for 1984-88 will produce an increase in services employment of 2.2 percent per year.

CHAPTER 7

AGRICULTURE

Short-Term Forecast

The performance of the agriculture sector during 1980-81 will be affected by factors that influence the demand for and the supply of specific farm commodities. As in past years, some of the most significant of these factors are external to the production portion of the agriculture sector, reflecting national and international developments and disturbances. The effects which come from the U.S.-Iranian confrontation are still unknown, substantial layoffs are currently occurring in the U.S. automobile industry, and the OPEC nations have yet to agree on the size of their next price hike and whether to continue accepting U.S. dollars in payment for their product. All these developments are unfolding against the backdrop of an economic downturn accompanied by a double-digit inflation rate.

Economic Slowdown

A decline in real gross national product is among the projected demand factors. Seasonally adjusted growth rates in real gross national product averaged only 0.1 percent during the first three quarters of 1979, and a decline is expected through the first two quarters of 1980. However, the anticipated decline in real gross national product is less than that experienced during the 1974-75 downturn.

Per capita real disposable income declined about 1 percent from the first to the third quarters of 1979. Per capita real expenditures on shoes and clothing and on food and beverages increased only 1.3 and 2.4 percent, respectively, during the same period. With the slowdown anticipated for the first half of 1980, dollar expenditures on food and beverages may not increase enough to offset expected price increases and to maintain per capita food consumption at 1979 levels. However, the aggregate demand for most food products is relatively inelastic. Only the demand for red meat shows some responsiveness. And so, the lack of growth in consumers' real incomes may show up in mitigating upward movements in retail meat prices, as well as reduced demands for relatively expensive food items and such marketing services as convenience foods and meals away from home.

A major factor influencing effective demand for food and fiber products is the size of the gainfully employed work force. Total U.S. employment is forecast at 97.4 million for 1980 and 99.1 million for 1981, respectively. Current projections for unemployment rates are 7.4 and 7.3 percent in 1980 and 1981, respectively. These figures are above the 6.0 percent rate for 1978 and 1979 and reflect the impact of the economic slowdown.

Export Demand

The value of agricultural exports in fiscal year 1979 (October-September) reached a record $32 billion, a 17 percent increase over FY 1978. Subtracting the value of agricultural imports (mainly coffee, meats, fruits, nuts, vegetables, sugar, cocoa, rubber, and wine), left a net trade balance of about $15.8 billion to help offset substantial trade deficits in nonagricultural items. There was some increase in physical volumes exported, but about 75 percent of the increase in values of FY 1979 exports resulted from higher prices.

Economic growth in export markets is expected to be slower in FY 1980. In many developed nations, a growth rate of 2 to 3 percent is expected. However, the demand for food and feed grains should continue to be strong. Production this year is expected to be down about 26 percent in the USSR. In India, a reduction of 17 million tons is expected. Output reductions are expected also in Western Europe, Eastern Europe, Canada, and Australia.

Input Costs Higher

The agriculture sector can expect no relief from the continuing push of rising farm production costs during 1980. The outlays rose about 16 percent between 1978 and 1979, mostly because of higher prices for inputs of both farm and nonfarm origin. The major inputs of farm origin for which sharp increases occurred were feed and feeder cattle. Higher prices for fuels and lubricants, pesticides, herbicides, fertilizer, and farm machinery also boosted out-of-pocket production expenses between 1978 and 1979.

Key Item--Energy Costs

The main concern this year is again the uncertainty regarding supplies and prices of petroleum that will be available for use in the agriculture sector. This past year, prices paid by farmers increased 49 percent for gasoline and 73 percent for diesel fuels. The outlook for 1980 is for continued tight supplies and increasing prices that are highly susceptible to political developments in the currently tense Middle East situation. The only fuel input for which prices dropped this past year was LP gas, which showed an 18 percent drop to 41.3 cents per gallon.

The outlook for petroleum in 1980 is for a continued tight supply situation in which the federal government can be expected to intervene to ameliorate effects of shortages in critical areas, including the production agriculture sector. The use of diesel fuel on farms continues to increase relative to gasoline, and the price spread between the two continues to narrow. Diesel power is used in virtually all new tractors and combines. The ratio between prices of regular gasoline and diesel continues to fall; from 1.55 in 1973 to 1.31 in 1978, and to 1.12 in 1979.

Stocks of gasoline in late October 1979 were about 225 million barrels, somewhat below normal inventory levels. However, increases are expected in the relative amounts of gasoline produced as goals for the production of distillates are met.

No shortages of natural gas or interruptions of commercial service are expected during 1980. The Federal Energy Regulatory Commission estimated the total supply available for the coming winter at 6,096 billion cubic feet, 2.3 percent more than last winter. Some additional reserve supplies will be available also for use in areas with unusually cold winter weather. Further, the National Gas Policy Act of 1978 assigns a number two priority to essential agricultural uses for supplies coming from interstate pipelines, second only to hospitals, homes, schools, and small commercial users. The priority covers the entire production-marketing chain: uses on farms (irrigation, drying, brooding), processing, warehousing, and the manufacture of inputs such as fertilizers, pesticides, herbicides, and other chemicals and supplies.

The outlook for LP gas (mainly propane) is not as favorable as it was last year. On September 30, estimated stocks were 19 percent below the average for 1975-78. In addition to farm uses for powering tractors, combines, and irrigation pumps, and for heating brooders and crop-drying facilities, propane is needed also for home heating and cooking and for petrochemical manufacturing. However, propane is covered by the 1973 Emergency Petroleum Allocation Act, which allots farm producers 100 percent of current requirements.

So far, nothing has been said regarding expected prices for petroleum-based fuels. The Tennessee Econometric Model projections of price increases in 1980 call for jumps of 12, 32, and 22 percent for gas, gasoline, and fuel oil, respectively. Analysts in the U.S. Department of Agriculture, taking into account the range of increases expected at the December 1979 OPEC meeting and the increasing amounts of petroleum shifting from long-term contract to spot-market sales, estimate that farmers in 1980 will pay at least 25 percent more for petroleum-based fuels than at the end of 1979.

Electric power availability, barring unforeseen developments, should be adequate in 1980. According to U.S. Department of Agriculture forecasts, prices paid by farmers are expected to increase about 8 percent over 1979, to about 4.4 cents per kilowatt hour.

Other Inputs

Supplies of major pesticides should be adequate in 1980. However, higher manufacturing and handling costs will result in 5 to 10 percent price increases for both insecticides and herbicides. For some fungicides, the increases may be from 15 to 20 percent.

Total domestic consumption of nitrogen, phosphate, and potash fertilizers in 1979-1980 will probably increase 3 to 5 percent over the 1978-79 levels. The use of nitrogen, phosphate, and potash is expected to increase to 11.1, 5.8, and 6.2 million tons, respectively. Price increases for all fertilizers may average 15 percent. Increases for anhydrous ammonia and urea are expected to exceed 15 percent, while increases for phosphates and potash are expected to be a little less.

Farm machinery purchases are quite sensitive to changes in farm incomes. Purchases increase when incomes do, but are postponed when net incomes decline. And so, expectations of reduced net farm incomes in 1980 indicate a lower demand for farm machinery. Higher interest rates and increased prices for these items will also discourage these purchases. Prices rose an average of 10 percent in 1979, and the increase will probably be greater in 1980, because of increases in iron and steel prices (10 percent) and in hourly wages of farm machinery production workers (12 percent).

Short-Term Projections

In Table 21 are shown the values estimated for 1980 and 1981 for selected items included in the agriculture sector of the Tennessee Econometric Model. Also shown are values for 1978 and 1979 and the projected average annual percent changes for 1980 and 1981.

An average annual increase of 8.47 percent is projected for cash receipts from farm marketings for all crops in Tennessee for 1980 and 1981. The estimated dollar figures are $834.1 million and $898.9 million, respectively. The five most important products in

TABLE 21

TENNESSEE AGRICULTURE SECTOR, SELECTED ECONOMIC VARIABLES, 1978-1981
(Millions of Dollars)

Item	1978	1979	1980	1981	Average Annual Percent Change 1980-81
Cash Receipts from Farm Marketings					
Crops	757.1	764.1	834.1	898.9	8.47
Meat Animals	564.2	643.5	688.6	726.3	6.24
Dairy	216.3	236.3	254.3	269.9	6.87
Poultry and Eggs	87.2	106.6	114.4	121.4	6.71
TOTAL	1,625.4	1,750.6	1,891.4	2,016.5	7.33
Total Expenses	702.4	770.9	841.8	906.6	8.45
GSP from Agriculture					
Current Dollars	923.0	979.6	1,049.6	1,109.9	6.45
1972 Dollars	526.2	490.8	496.3	501.3	1.06
Total Farm Employment (Thousands of jobs)	116.0	113.6	113.0	113.5	-0.07

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

this category for Tennessee are soybeans, tobacco, cotton, corn, and greenhouse and nursery products. They accounted for 22.2, 10.1, 4.7, 2.3, and 1.9 percent, respectively, of cash receipts from farm marketings in Tennessee in 1978.

The average annual change in cash receipts from meat animals for 1980-81 was projected at 6.24 percent. The respective dollar figures are $688.6 million and $726.3 million for 1980 and 1981. Within this category of products, cattle and calves accounted for 24.0 percent and hogs for 10.2 percent of total cash receipts from farm marketings in 1978.

Cash receipts from marketings of dairy products are projected at $254.3 million and $269.9 million for 1980 and 1981, respectively, with an average annual increase of 6.87 percent. The projections for poultry and eggs for the two years are $114.4 million and $121.4 million, respectively, with an average annual increase of 6.71 percent.

For the two years, total cash receipts from farm marketings were estimated at $1,891.4 million and $2,016.5 million, respectively, with average annual increases of 7.33 percent. After deductions are made for production expenses, gross state product from the agriculture sector is projected in current dollars, at $1,049.6 million for 1980 and $1,109.9 million for 1981. The projections in 1972 dollars are $496.3 million and $501.3 million, respectively, with an average annual increase for each year of 1.06 percent.

Total farm employment, which is composed of hired farm labor and unpaid family laborers, is projected to remain virtually unchanged in 1980 and 1981, with a very slight average annual decrease of -0.07 percent.

Long-Term Forecast

At first glance, the complex of factors that bear on the long-term outlook for the national and State agriculture sectors appear similar to those mentioned last year--recession, inflation, OPEC pricing policies, and foreign trade. But there is a major new element that has emerged this past year that has become one of overriding importance and which impacts on all of the factors listed. This is the geopolitical turmoil in the Middle East that began with the Iranian Revolution and the effects that it has on stability of prices and supplies of crude petroleum.

During this past year, there has been an unprecedented 50 percent increase in energy costs, and prospects are for further increases of perhaps 25 percent, along with possible production cutbacks by some of the major producing nations. In more immediate terms, the price increases, especially for consumers living on modest incomes, has created the dilemma of "heat or eat." And a further cause for concern and uncertainty is the possibility of interruptions, such as the 1973 Arab oil embargo, in crude oil supplies because of international political developments.

The rise in energy costs has impacted severely on consumer purchasing power. The Council of Economic Advisors estimates that these costs have risen in an amount equivalent to an individual tax increase in the neighborhood of $40 billion. There is a twofold effect on the agriculture sector. First, it drains away purchasing power, some of which might have been spent on food and fiber products. Second, it contributes directly and indirectly to raising farm production costs. Besides reducing net farm incomes, another effect is to raise consumer prices when cost "pass throughs" take place.

Unless current trends are reversed, all sectors in the American economy (including agriculture) will become increasingly vulnerable to damage from continuing energy price increases and instability of supplies of imported petroleum. In 1978, daily U.S. consumption of petroleum averaged 16.4 million barrels. Of this amount, 7.9 million barrels (48 percent of the total) came from off-shore sources.

In order to reduce American dependence on off-shore sources, there is a pressing need to develop as many different energy options as possible. The simple fact of the matter is that there is no single one-shot panacea, such as developing the technology for nuclear fusion power generation, or discovering a new 30 billion barrel pool of oil under Alaskan coastal waters. Even such a bonanza strike would free us from reliance on off-shore sources for only 10 or 11 years, if other domestic production and consumption rates remain unchanged. On December 11, 1979, the federal government offered 514,000 acres for oil exploration rights in the ice-filled waters of the Beaufort Sea, off the coast of Northern Alaska. The U.S. Geological Service estimated the volume of oil that could be recovered at from 500 million to 1.25 billion barrels. At 1978 consumption rates, this would represent a 30 to 76 day supply for the United States if these recovery expectations are realized.

What this all means is that supplies of petroleum and other fossil fuels have finite limits. Even though new sources are being explored, they too will be used up rapidly if our current voracious consumption rates are not reduced. But modern American agriculture has been developed on the basis of cheap energy to power farm tractors and machinery; operate all kinds of processing and distribution systems; and manufacture fertilizers, agricultural chemicals, and other supplies. Liberal use of cheap energy has allowed the substitution of capital and mechanization for human and animal power.

For the agriculture sector, two options are available. The first deals with adoption of practices that will maintain yields but use greater amounts of organic wastes to replace commercial fertilizers. The materials to be substituted include animal manures, treated sludge, compost, and cannery wastes. The second option deals with use of new and existing crops and residues as new sources of energy to replace those currently obtained from fossil fuels. Success in such efforts would allow movement to reliance on renewable energy resources.

Several raw materials from the agriculture sector can be considered for the production of ethyl alcohol and methane. The first is existing crops such as corn. One bushel of corn can yield approximately 2.6 anhydrous gallons of alcohol, which can be used to help fuel internal combustion engines now operated entirely on gasoline. U.S. Department of Agriculture analysts view alcohol from surplus and lower quality grains and from grain process by-products as a key alternative motor fuel over the next decade.

Crop residues and by-products are high in cellulose, which also can be fermented to produce ethyl alcohol. Animal residues and other organic materials that are subjected to anaerobic fermentation will produce biogas that is 50 to 70 percent methane.

Finally, new crops, particularly fast growing ones such as kenaf, roselle, sorghums, and crotolaria, have excellent potential as renewable raw materials for fuel production. Such crops are chemically similar to wood and are high yielding.

The most obvious implication is the need for high priority research and development programs to facilitate the economic feasibility of substituting as many energy sources as possible from the agriculture sector for those from finite supplies of fossil fuels.

Long-Term Projections

Shown in Table 22 are the values estimated for selected variables included in the agriculture sector of the Tennessee Econometric Model for the years 1979 through 1986. The last column contains the average annual percent change from the preceding year for 1981 through 1988.

An average annual increase of 6.73 percent in cash receipts from farm marketings of all crops in Tennessee during 1981 through 1988 is projected. The increase in dollar terms between 1981 and 1988 is $505.6 million. Cash receipts from meat animals are projected to increase at an average annual rate of 8.72 percent, from $726.3 million to $1,343.3 million. Farm marketings of dairy products are projected to increase $136.9 million, an average annual increase of 6.05 percent. Finally, the projections for cash receipts from sales of poultry and eggs show an increase of $99.4 million for the period, an average annual rate of 8.57 percent.

Total cash receipts from farm marketings are projected to increase at an average annual rate of 6.57 percent, from $2,016.5 million in 1981 to $3,375.3 million in 1988. After deductions are made for production expenses, gross state product from the agriculture

TABLE 22

TENNESSEE AGRICULTURE SECTOR, SELECTED ECONOMIC VARIABLES, LONG-TERM FORECASTS
(Millions of Dollars)

Item	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	Average Annual Percent Change 1981-88
Cash Receipts from Farm Marketings											
Crops	764.1	834.1	898.9	965.4	1,035.0	1,105.0	1,176.6	1,251.4	1,326.6	1,404.5	6.73
Meat Animals	643.5	688.6	726.3	791.3	871.9	956.8	1,045.7	1,141.0	1,239.3	1,343.3	8.72
Dairy	236.3	254.3	269.9	287.6	305.5	323.9	343.1	363.8	385.1	406.8	6.05
Poultry and Eggs	106.6	114.4	121.4	132.5	145.2	158.5	172.7	188.0	203.9	220.8	8.57
TOTAL	1,750.6	1,891.4	2,016.5	2,176.8	2,357.5	2,544.3	2,738.2	2,944.3	3,154.9	3,375.3	6.57
Total Expenses	770.9	841.8	906.6	984.5	1,043.7	1,102.7	1,162.1	1,222.9	1,283.7	1,345.7	6.05
Gross State Product from Agriculture											
Current Dollars	979.6	1,049.6	1,109.9	1,192.3	1,313.8	1,441.6	1,576.0	1,721.4	1,871.2	2,029.6	8.60
1972 Dollars	490.8	496.3	501.3	499.4	509.5	520.4	531.2	542.2	552.9	563.4	1.34
Total Farm Employment (Thousands of workers)	113.6	113.0	113.5	113.1	113.4	113.6	114.1	114.6	115.0	115.5	0.27

SOURCE: Tennessee Econometric Model, November 15, 1979.

sector is projected to increase from $1,109.9 million in 1981 to $2,029.6 million in 1988, with an average annual rate of increase of 8.60 percent. The projections in constant 1972 dollars show an increase from $501.3 million to $563.4 million, with average annual increases of 1.34 percent.

Total farm employment--hired farm laborers and unpaid family labor--is projected to increase at an average annual rate of 0.27 percent.

CHAPTER 8

STATE AND LOCAL GOVERNMENT

Short-Term Forecast

Government in Tennessee, as in all modern economic societies, is a significant factor in the State's economic life. This is true because of its contributions to the gross state product and the pattern of taxation and public spending. While priorities for taxing and spending are not likely to experience drastic changes, the overall rate of growth in the public sector will be low during the next two years.

Tax revenue growth in current terms is expected to be moderate during the next two years--primarily because of the current economic slowdown and, second, because of the relative unresponsiveness of state and local taxes to economic growth. In FY 1980, taxes in real terms are expected to remain relatively constant and in FY 1981, they are expected to grow at a rate of 2 percent. In real terms, the resources of the public sector will improve only marginally unless sources of new revenue are exploited.

The effect of declining growth in public resources on service delivery will be uneven by level of government. This decline will be particularly strong for the State, which will experience a 3.4 percent real decline in tax revenues during FY 1980 and an 0.9 percent real decline in FY 1981. Local government tax revenues will grow in real terms by an average of 5 percent per year. Services will also be affected unevenly.

The declining real growth of available public resources is especially damaging to public services funded from major, slow-growing taxes. A good example is the State Transportation Department and local highway agencies, which are primarily financed by the motor fuels taxes. In current terms, these taxes seem sure to level off or decline and, in real terms, they are expected to decline in exact proportion to the increase in the price of goods and services that highway agencies purchase. No increase in real resources can be expected for nontransportation agencies, with a small decrease expected under current revenue arrangements. With some expected increase in State population, maintaining the current level of per capita public services will depend on the ability to increase the efficiency of government operations. It is highly unlikely that increased efficiency can offset declining real resources in the transportation agencies; it is more likely in other agencies, but whether it can be accomplished is still questionable.

Government Sector in Economic Slowdown

As in past years, Tennessee continues to be a low-tax state. In spite of significant tax increases on two occasions in the 1970's, taxes as a percent of personal income remain substantially below the 50-state average (in 1977 these are 10.7 percent in Tennessee compared with 12.3 percent in the 50 states). Because of the low responsiveness of Tennessee's tax revenues to growth in economic activity, taxes tend to become a smaller factor in the economy. By 1981 state-local taxes are expected to represent less than 9.0 percent of the State's personal income, barring unforeseen significant new tax effort at the State or local level.

State and local government expenditures before, during, and after the current recessionary period are expected to follow a markedly different pattern from the previous two recessions. Sharp increases in the expenditure growth rate were experienced prior to the previous recessions, followed by equally sharp declines within a year following the recession (Figure 13). By contrast, the rate of state and local government expenditure growth has remained relatively constant leading up to the current recession, and this trend is expected to continue. Nominal expenditure growth for state and local governments will rise from 9.5 percent in FY 1979 to 11 percent in FY 1982. Local governments will exhibit the more rapid growth trend throughout this period as resources will be more plentiful.

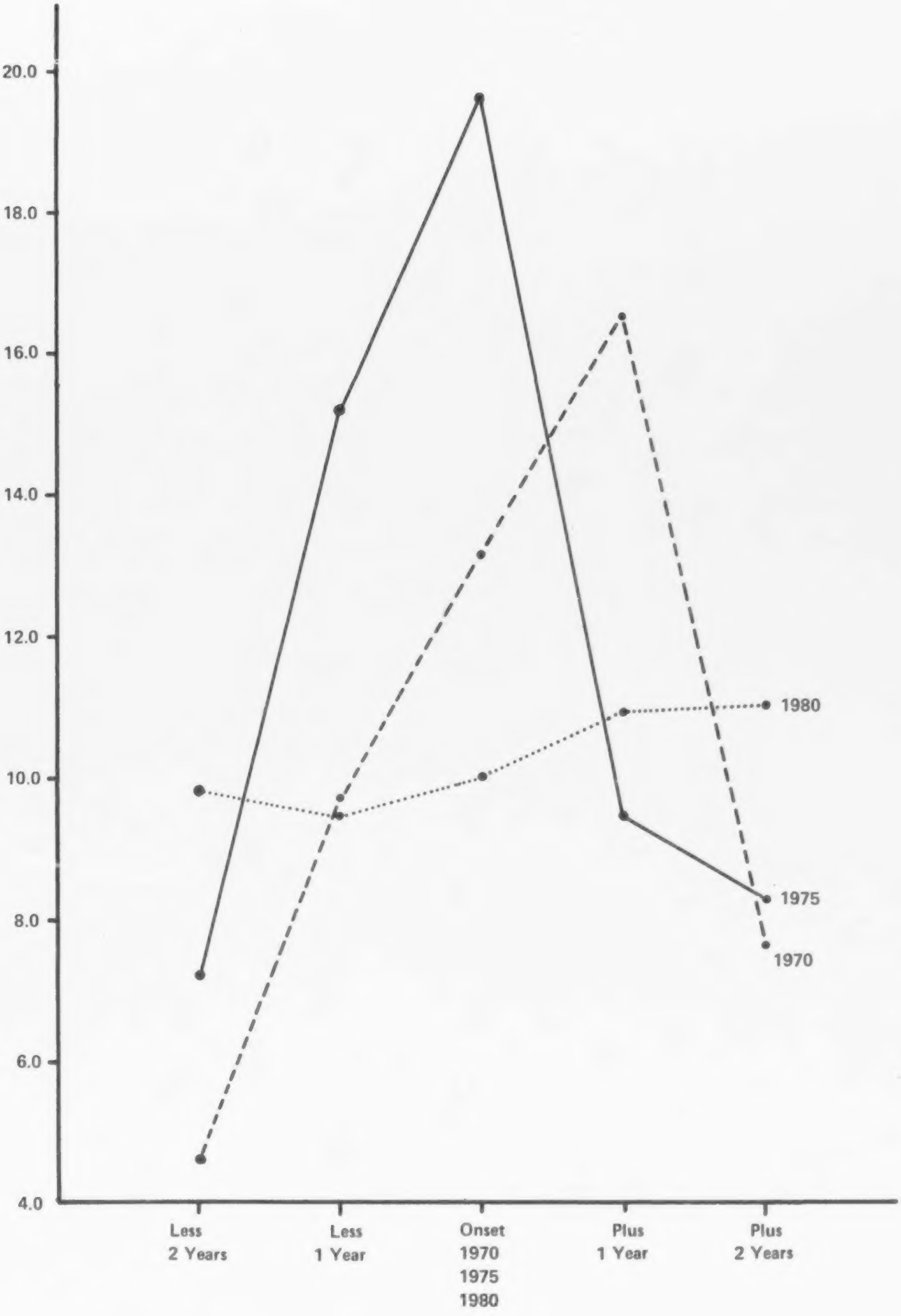
Expenditure growth trends are also reflected in the relationship of expenditures to gross state product (Figure 14). Rapidly growing expenditures combined with slow or negative output growth caused substantial increases in the state and local expenditure share of gross state product during both previous recessions. Following the recession this proportion declined as expenditure growth declined and gross state product increased. The steady expenditure trend during the current recession has tended to keep pace with nominal gross state product, leading to a relatively constant expenditure share over the next several years, with an increase of less than one-half percent from the recent low of 11.75 percent in 1979 to a high of 12.1 percent in 1982.

Real expenditure growth trends appear to be less related to economic swings (Figure 15). Positive growth in real expenditures

FIGURE 13

GROWTH RATES FOR CURRENT DOLLAR STATE AND LOCAL GOVERNMENT EXPENDITURES

(Percent)

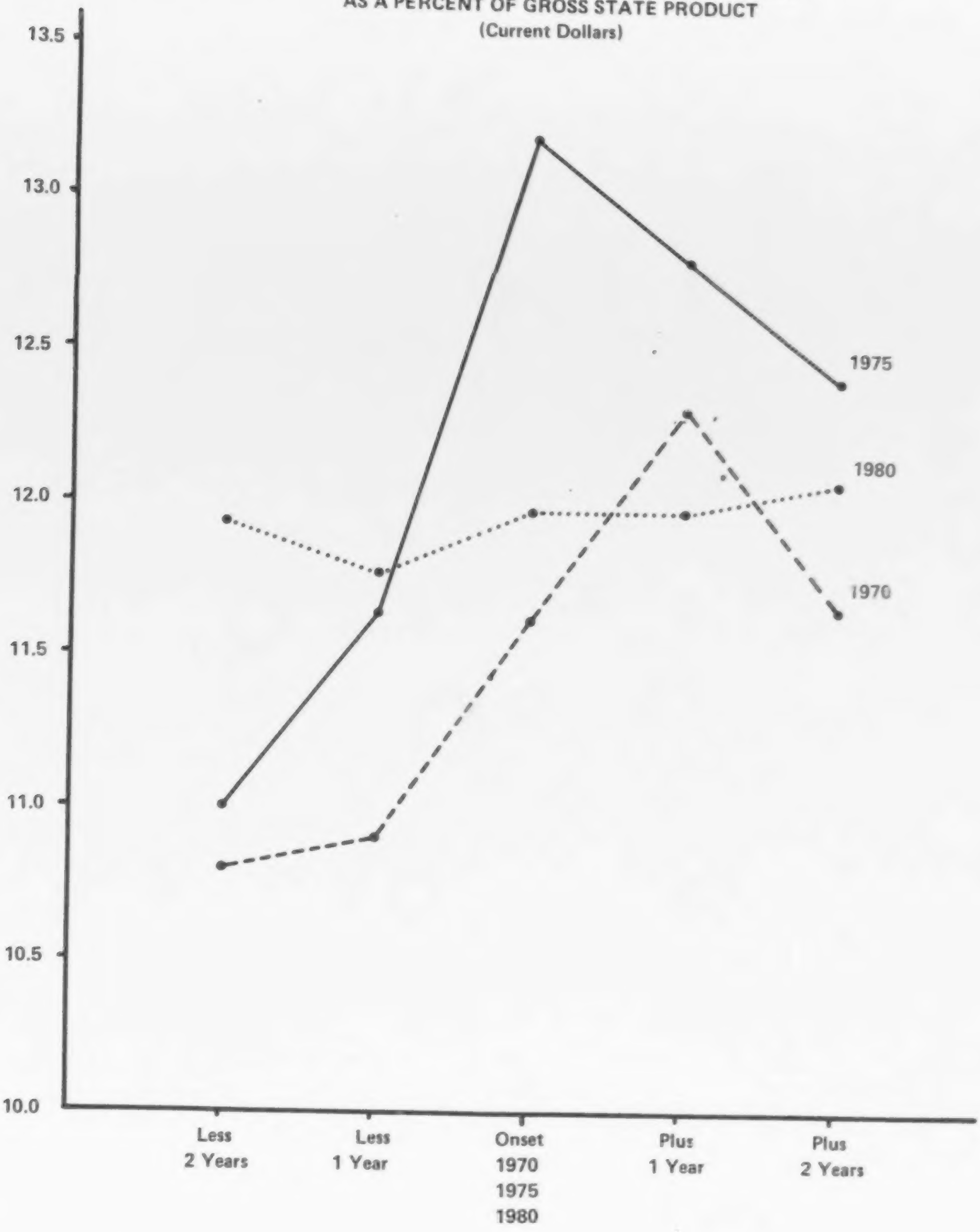


Calculated as the growth rate of total state and local government direct general expenditures between each pair of fiscal years.

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 14

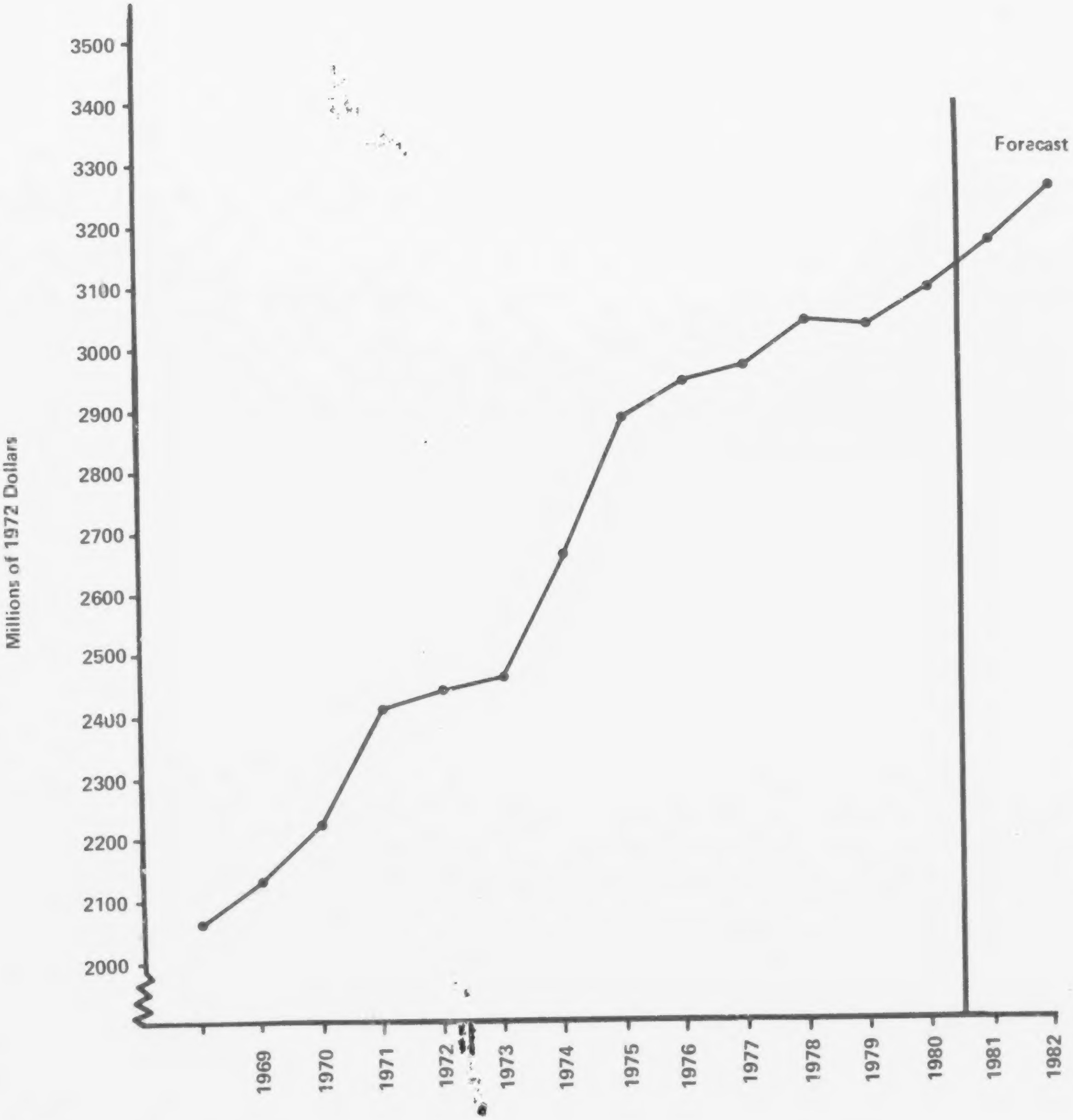
STATE AND LOCAL GOVERNMENT EXPENDITURES AS A PERCENT OF GROSS STATE PRODUCT (Current Dollars)



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

FIGURE 15

REAL STATE AND LOCAL GOVERNMENT EXPENDITURES



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

has occurred every year since FY 1968 with the exception of FY 1979. Continued real growth of between 2 and 3 percent per year is expected for FY 1980 through 1982.

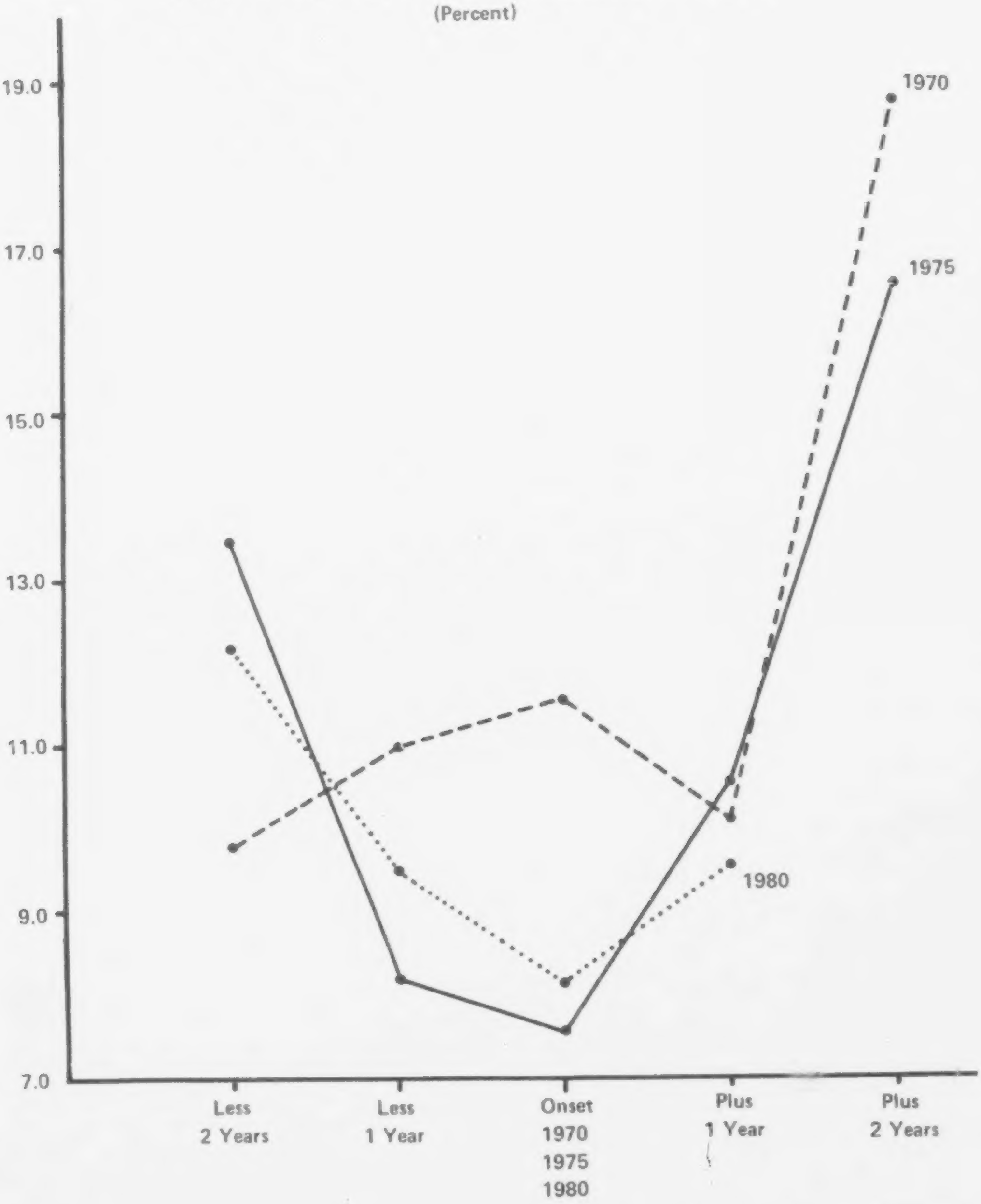
The anticipated state and local government tax revenue trend for the near future is similar to what has been experienced in previous recessions. Each recession has led to a noticeable decline in tax revenue growth followed by a rapid upturn as the economy rebounded (Figure 16). Two factors--the slowdown in income growth during the recession--and the tendency for tax elasticities to decline during a recession--combine to cause the tax growth decline. Similarly, rapid income growth, together with higher tax elasticities, lead to the rapid tax revenue response after a recession. A higher growth rate in tax revenues is anticipated during FY 1981 as the economy becomes stronger. Though the forecast is not shown in Figure 14, the tax revenue growth for FY 1982 should exhibit rapid growth if the trend following the current recession is reflective of past time periods.

Most of the fluctuations in state and local government tax revenues can be attributed to state tax sources. With few exceptions local tax revenues have continued to grow rapidly even during recessions, while state revenue growth has fluctuated widely, causing the trends exhibited in Figure 16.

Local governments are strictly service-oriented and service demands do not fluctuate widely during inflationary times. With service costs rising, local governments have little room for cutbacks and are forced to raise tax rates to meet service demands. The state government, on the other hand, has greater flexibility to

FIGURE 16

GROWTH RATES FOR STATE AND LOCAL TAX REVENUES
(Percent)



Calculated as the growth rates of total state and local tax revenues between each pair of fiscal years.

SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

cut back during a recession and may be more hesitant to raise tax rates. Further, local workers are becoming more organized and are better able to bring wage pressure to bear on local governments than state workers would be at the state level.

Real tax revenue growth has also been affected during past recessions (Figure 17). The only declines in real tax revenues came during the recession of 1974-75 and during FY 1979 as a result of a change in tax payment patterns. Nonetheless, the 1969-1970 recession led to less than 1 percent real tax revenue growth, and the 1979-1980 recession will lead to no noticeable increase in real tax revenues during FY 1980, and to only a small increase in real revenues for 1981. Again, each previous recession has been followed two years after by a rapid real growth in tax revenues, which may suggest a similar occurrence for FY 1982.

Government Contribution to Gross State Product

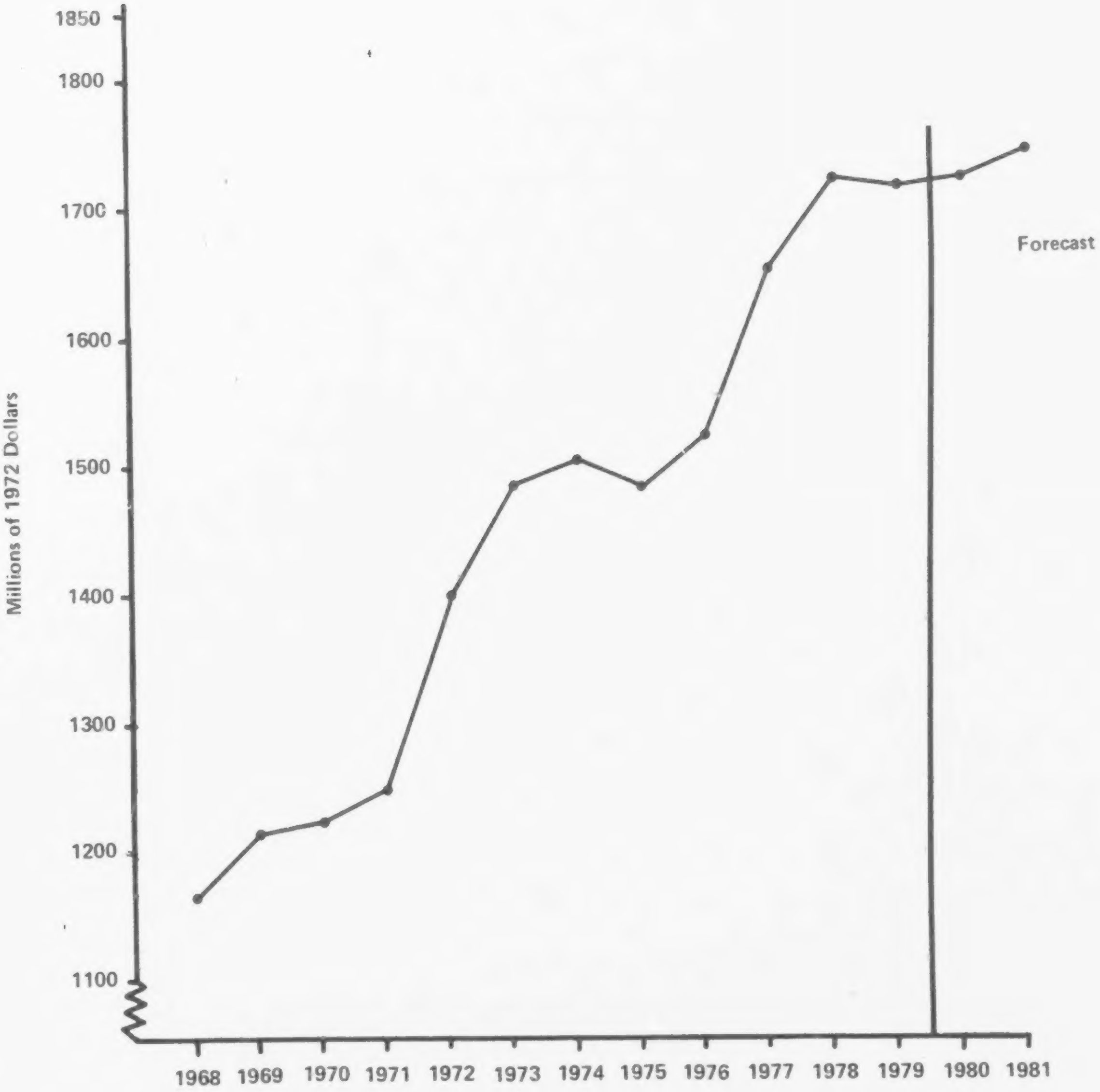
In terms of contributions to Tennessee gross state product, the government share has not changed much in the last decade and is not expected to change much in the next decade. Government contribution to gross state product increased less than 1 percentage point from 1970 to 1979 (from 10.8 percent to 11.6 percent) and is expected to remain close to 11.6 percent in the 1980's. The federal and state-local distribution is not likely to change much. In 1979, the state-local sector contributed 62.2 percent and the federal sector 37.8 percent of the government contribution.

Wages and Salaries

State and local average annual wages and salaries have grown less rapidly in the past decade than wages and salaries for all in-

FIGURE 17

REAL STATE AND LOCAL GOVERNMENT TAX REVENUES



SOURCE: Tennessee Econometric Model, Historical Data and November 15, 1979.

dustries and for federal civilian employees. In 1970 state and local average annual wage and salary was 90.8 percent and 58.2 percent, respectively, for all employees in Tennessee and for federal civilian employees. In 1980, the estimated percentages were 89.1 percent and 52.1 percent, respectively.

The decline in the relative status of state and local employees is explained by trends in public funds. Wages and salaries of public employees are a function of the availability of public funds. These funds falter in times of economic stagnation or downturn and fail to recover in times of high economic activity. In the last two recessions, real wages for state and local employees declined and grew about equally with average Tennessee wages in the remaining years.

From 1969 to 1970, real state and local average annual wages declined by 1.7 percent (from $5,933 to $5,893) and from 1975 to 1976 they declined by 1.6 percent (from $6,290 to $6,189). A similar decline is indicated in the 1979-1980 period. State salary increases averaged 7 percent and the personal consumption expenditure deflator increased by 8.6 percent, indicating a real wage decline of about 1.6 percent. Because of the low growth in state taxes projected for 1981, wages and salary increases will be no greater, possibly less than in 1980.

The failure of average annual state and local employee wages and salaries to keep pace with private industry wages and salaries has serious implications as governments seek to employ and retain competent employees.

Average annual wages and salaries of state and local employees falter or decline in times of recession because tax revenues falter or decline. Tax revenues fail to keep pace with economic growth, first, because Tennessee's tax system is inelastic and, second, because the elasticity coefficient declines precipitately during recessionary periods. The average elasticity coefficient for state taxes has been measured at 0.85. In the last three recessions it fell below this average--to 0.76 in the 1968-1970 period and to 0.71 in the 1973-75 period. In 1979-1980, it is now estimated to be even lower at 0.61. Some of this decline, however, is related to the leveling off of the motor fuels taxes. The elasticity of general fund taxes is expected to be near the level of the same taxes during previous recessions. Another negative factor in available public funds is the decline in the inheritance and estate tax due to a statutory change increasing exemptions.

Declining tax elasticities during recessions are a result of the Tennessee tax structure. Revenues from volume taxes, such as the selective sales taxes, motor fuels, tobacco, and alcohol, are not responsive to price changes. Thus, in the the absence of growth in consumption, revenues fail to keep pace with nominal income growth. Also, while general sales taxes reflect price changes, the income elasticity of sales taxes tends to fall during recessions because durable goods purchases are delayed. This delay is a primary cause of the post-recession boom in tax revenues. States relying on tax systems more closely aligned with income are likely to experience smaller fluctuations in tax growth and are having less difficulty in the current economic climate.

Public Employment

The public sector historically has absorbed almost 18 percent of state employment, of which about four-fifths is state and local and one-fifth federal civilian. Average employment increases have averaged about 4 percent per year but the increase is expected to moderate in the 1980's. Growth rates tended to be above average in recessionary periods of the 1970's and this tendency is expected to continue to a lesser extent in the current economic slowdown. State and local employment growth is expected to exceed 2 percent through 1981 and remain below 2 percent for the next half decade at least.

Long-Term Forecast

Long-term government sector activity is particularly hard to forecast because the trends are less a function of market activity than with the other sectors. Government spending and taxing behavior, though related to economic activity, is administratively set and can vary widely from what would be forecast by a model. Nonetheless, there are some trends which may show the direction of government activity in the 1980's.

The current Tennessee state tax structure is relatively income-inelastic. As noted above, the average elasticity has been 0.85. If this elasticity were to hold for the 1980's, state tax revenues would grow at a rate noticeably below gross state product and the revenue growth is not likely to exceed the increased cost of providing state and local government services. Cutbacks in federal intergovernmental transfers (such as revenue sharing) or reductions in the growth rate of federal funds could add pressure on State budgets. The result could be no increase in per capita service levels throughout the 1980's.

Demographic trends may alter the type of services provided by governments. Significant declines in the 15-24 year-old group could mean lower demands for education. Increasing numbers of older residents, on the other hand, may lead to higher demands for other services; Medicaid would be one example.

In sum, state and local government activity in the 1980's is likely to remain a relatively constant share of gross state product. Per capita real service levels, then, will probably remain constant though the mix of services may be altered.

VOLUME 2

APPENDIX TABLES

APPENDIX A

TENNESSEE ECONOMETRIC MODEL FORECAST DATA (1979-1988)

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-1: TENNESSEE SELECTED INDICATORS

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TN GROSS STATE PRODUCT (MIL. DOL.)	TGSP	43496.6	47029.4	52170.2	57595.6	63153.4	69189.9	75537.9	82698.7	90791.1	99458.8
2	PERCENTAGE CHANGE		10.74	8.12	10.93	10.40	9.65	9.56	9.17	9.48	9.79	9.59
3												
4	TN GROSS STATE PRODUCT (MIL 72 $)	TGSP*	26470.1	26467.5	27399.3	28191.6	28990.3	29837.9	30666.2	31638.7	32780.5	33955.4
5	PERCENTAGE CHANGE		1.93	-0.01	3.52	2.89	2.83	2.92	2.78	3.17	3.61	3.58
6												
7	US GROSS NATIONAL PRODUCT (BIL 72 $)	GNP*	1418.5	1428.9	1482.5	1528.4	1569.1	1610.5	1651.6	1699.7	1759.3	1816.7
8	PERCENTAGE CHANGE		1.38	0.73	3.75	3.10	2.66	2.64	2.55	2.91	3.51	3.26
9												
10	TN PERSONAL INCOME (MIL. DOL.)	TPY001	31797.8	35098.3	38933.7	42906.2	46965.2	51274.7	55903.3	61144.2	67053.8	73500.1
11	PERCENTAGE CHANGE		11.46	10.38	10.93	10.20	9.46	9.18	9.03	9.37	9.66	9.61
12												
13	TN PERSONAL INCOME (MIL 72 $)		19424.4	19740.3	20437.6	21063.4	21672.9	22293.4	22930.0	23653.5	24508.0	25441.4
14	PERCENTAGE CHANGE		2.14	1.63	3.53	3.06	2.89	2.86	2.86	3.16	3.61	3.81
15												
16	US PERSONAL INCOME (BIL 72 $)		1171.5	1188.9	1231.7	1269.4	1306.7	1344.9	1382.6	1422.0	1468.9	1518.7
17	PERCENTAGE CHANGE		2.32	1.48	3.60	3.06	2.94	2.92	2.81	2.85	3.30	3.39
18												
19	TN EMPLOYED PERSONS (THOUS)	TNTOT	1870.8	1891.9	1921.1	1943.9	1966.1	1988.9	2011.8	2036.8	2065.7	2095.7
20	PERCENTAGE CHANGE		3.07	1.13	1.54	1.19	1.14	1.16	1.15	1.24	1.42	1.45
21												
22	US EMPLOYED PERSONS (THOUS)	UNTOT	96593.	97355.	99124.	100594.	102128.	103621.	105002.	106419.	107931.	109435.
23	PERCENTAGE CHANGE		2.35	0.79	1.82	1.48	1.52	1.46	1.33	1.35	1.42	1.39
24												
25	TN UNEMPLOYMENT RATE	TNUNR	6.0	7.1	6.9	6.8	6.7	6.5	6.4	6.2	5.9	5.4
26												
27	US UNEMPLOYMENT RATE	UEUNR	6.0	7.4	7.3	7.2	7.0	6.8	6.6	6.3	6.0	5.5
28												
29	IMPLICIT DEFLATOR, GSP	UDGSP	164.3	177.7	190.4	204.3	217.8	231.9	246.3	261.4	277.0	293.0
30	PERCENTAGE CHANGE		8.64	8.13	7.16	7.30	6.63	6.45	6.23	6.11	5.96	5.80
31												
32	IMPLICIT DEFLATOR, GNP	UDGNP	165.7	179.7	193.3	208.0	222.1	236.7	251.8	267.8	284.4	301.4
33	PERCENTAGE CHANGE		9.01	8.45	7.57	7.60	6.78	6.57	6.38	6.35	6.20	5.98
34												
35	TN MFG OUTPUT / EMPLOYEE (THOUS 72 $)		17.9	17.9	18.5	19.1	19.6	20.1	20.5	21.0	21.6	22.2
36	PERCENTAGE CHANGE		2.21	-0.30	3.79	2.88	2.60	2.45	1.98	2.46	2.88	2.79
37												
38	US MFG OUTPUT / EMPLOYEE (THOUS 72 $)		16.9	17.2	17.8	18.3	18.8	19.3	19.9	20.6	21.4	22.1
39	PERCENTAGE CHANGE		0.30	2.16	3.40	2.63	2.79	2.97	2.92	3.45	3.75	3.28
40												
41	TN PER CAPITA INCOME ($)	TPYPC	7228.	7911.	8715.	9534.	10363.	11231.	12149.	13177.	14322.	15570.
42	PERCENTAGE CHANGE		10.39	9.45	10.16	9.39	8.70	8.38	8.17	8.46	8.69	8.71
43												
44	TN POPULATION (THOUS.)	TPOP	4399.	4436.	4467.	4500.	4532.	4565.	4601.	4640.	4682.	4721.
45	PERCENTAGE CHANGE		0.97	0.85	0.69	0.74	0.70	0.73	0.79	0.85	0.89	0.83

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-2: TENNESSEE GROSS STATE PRODUCT BY SECTOR
(Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	GROSS STATE PRODUCT	TGSP	43496.6	47029.4	52170.2	57595.6	63153.4	69189.9	75537.9	82698.7	90791.1	99498.8
2	PERCENTAGE CHANGE		10.74	8.12	10.93	10.40	9.65	9.56	9.17	9.48	9.79	9.59
3												
4	MANUFACTURING	TGPMFG	15142.1	16052.4	17933.1	19944.2	22071.6	24393.9	26735.8	29373.5	32424.1	35761.4
5	PERCENTAGE CHANGE		11.81	6.01	11.72	11.21	10.67	10.52	9.60	9.87	10.39	10.29
6												
7	DURABLE GOODS	TGPDUR	6998.0	7475.9	8563.4	9549.0	10606.1	11714.0	12860.7	14131.9	15676.6	17360.5
8	PERCENTAGE CHANGE		9.73	6.83	14.55	11.51	11.07	10.45	9.79	9.88	10.93	10.74
9												
10	NONDURABLE GOODS	TGPNDR	8144.1	8576.5	9369.8	10395.2	11465.5	12679.9	13875.1	15241.6	16747.5	18400.9
11	PERCENTAGE CHANGE		13.65	5.31	9.25	10.94	10.30	10.59	9.43	9.85	9.88	9.87
12												
13	CONSTRUCTION	TGPCON	1849.7	2073.4	2344.8	2604.8	2862.6	3129.6	3407.9	3716.4	4066.9	4438.6
14	PERCENTAGE CHANGE		16.07	12.09	13.09	11.09	9.90	9.33	8.89	9.05	9.43	9.14
15												
16	MINING	TGPMIN	476.1	614.2	798.7	971.0	1089.3	1222.5	1325.1	1491.9	1692.3	1891.8
17	PERCENTAGE CHANGE		23.47	29.01	30.04	21.57	12.18	12.23	8.39	12.59	13.43	11.79
18												
19	TRADE	TGPTRD	7037.8	7702.0	8600.7	9490.7	10395.3	11361.6	12413.0	13611.4	14956.4	16383.3
20	PERCENTAGE CHANGE		10.39	9.44	11.67	10.35	9.53	9.30	9.25	9.65	9.88	9.54
21												
22	SERVICES	TGPSER	4653.7	5094.6	5632.5	6171.9	6724.0	7316.0	7952.3	8692.8	9520.1	10407.1
23	PERCENTAGE CHANGE		11.81	9.47	10.56	9.58	8.95	8.80	8.70	9.31	9.52	9.32
24												
25	FINANCE, INSURANCE & REAL ESTATE	TGPFIR	4996.5	5400.8	5934.3	6470.9	6990.6	7538.9	8164.3	8865.2	9659.0	10513.9
26	PERCENTAGE CHANGE		11.19	8.09	9.88	9.04	8.03	7.84	8.30	8.59	8.95	8.85
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TGPTCU	3294.4	3565.1	3865.2	4159.2	4477.8	4844.0	5232.9	5644.2	6075.2	6527.1
29	PERCENTAGE CHANGE		8.59	8.22	8.42	7.61	7.66	8.18	8.03	7.86	7.64	7.44
30												
31	GOVERNMENT	TGPGOV	5066.7	5477.3	5951.0	6590.7	7228.4	7941.8	8730.5	9582.0	10526.2	11546.1
32	PERCENTAGE CHANGE		10.90	8.10	8.65	10.75	9.68	9.87	9.93	9.75	9.85	9.69
33												
34	FEDERAL	TGPFG	1913.0	2035.6	2182.8	2402.0	2628.1	2883.0	3162.8	3465.3	3791.1	4143.6
35	PERCENTAGE CHANGE		7.75	6.41	7.23	10.04	9.41	9.70	9.70	9.57	9.40	9.30
36												
37	STATE & LOCAL	TGPSLG	3153.6	3441.7	3768.1	4188.7	4600.3	5058.8	5567.7	6116.7	6735.1	7402.5
38	PERCENTAGE CHANGE		12.91	9.14	9.48	11.16	9.83	9.97	10.06	9.86	10.11	9.91
39												
40	AGRICULTURE	TGPAG	979.6	1049.6	1109.9	1192.3	1313.8	1441.6	1576.0	1721.4	1871.2	2029.6
41	PERCENTAGE CHANGE		6.14	7.14	5.75	7.42	10.19	9.73	9.33	9.22	8.70	8.47
42												
43	PER CAPITA GROSS STATE PRODUCT ($)	TGSPPC	9887.	10601.	11678.	12798.	13935.	15155.	16416.	17822.	19393.	21077.
44	PERCENTAGE CHANGE		9.68	7.21	10.17	9.58	8.88	8.76	8.32	8.56	8.81	8.69

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-3: TENNESSEE MANUFACTURING GROSS PRODUCT
(Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	FORECAST DATA 1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TOTAL MANUFACTURING	TGPMFG	15142.1	16052.4	17933.1	19944.2	22071.6	24393.9	26735.8	29373.5	32424.1	35761.4
2	PERCENTAGE CHANGE		11.81	6.01	11.72	11.21	10.67	10.52	9.60	9.87	10.39	10.29
3												
4	DURABLE GOODS	TGPDUR	6998.0	7475.9	8563.4	9549.0	10606.1	11714.0	12860.7	14131.9	15676.6	17360.5
5	PERCENTAGE CHANGE		9.73	6.83	14.55	11.51	11.07	10.45	9.79	9.88	10.93	10.74
6												
7	FURNITURE AND FIXTURES	TGPFUR	445.7	474.8	552.7	593.0	628.0	683.9	750.8	831.6	917.3	996.1
8	PERCENTAGE CHANGE		8.38	6.51	16.41	7.30	5.90	8.91	9.78	10.77	10.31	8.58
9												
10	FABRICATED METAL PRODUCTS	TGPFAB	992.9	1044.2	1188.8	1324.0	1449.9	1569.7	1702.6	1855.6	2037.4	2264.9
11	PERCENTAGE CHANGE		7.52	5.17	13.84	11.37	9.51	8.26	8.47	8.99	9.79	11.17
12												
13	NONELECTRICAL MACHINERY	TGPNEM	1333.7	1432.7	1619.2	1820.4	2046.1	2266.5	2478.5	2702.8	2963.1	3286.6
14	PERCENTAGE CHANGE		8.11	7.42	13.02	12.42	12.40	10.77	9.36	9.05	9.63	10.92
15												
16	ELECTRICAL MACHINERY	TGPELM	1318.0	1408.7	1576.1	1783.0	2025.7	2299.7	2597.1	2920.8	3282.7	3672.5
17	PERCENTAGE CHANGE		11.34	6.88	11.88	13.12	13.61	13.53	12.93	12.46	12.39	11.87
18												
19	TRANSPORTATION EQUIPMENT	TGPTRE	818.9	887.9	1002.5	1133.9	1261.1	1393.5	1519.5	1658.6	1829.6	2026.5
20	PERCENTAGE CHANGE		11.01	8.42	12.91	13.12	11.21	10.50	9.04	9.15	10.31	10.76
21												
22	OTHER DURABLE GOODS	TGPODR	2088.7	2227.7	2624.2	2894.8	3195.3	3500.7	3812.2	4162.5	4646.6	5114.0
23	PERCENTAGE CHANGE		10.66	6.66	17.80	10.31	10.38	9.56	8.90	9.19	11.63	10.06
24												
25	NONDURABLE GOODS	TGPNDR	8144.1	8576.5	9369.8	10395.2	11465.5	12679.9	13875.1	15241.6	16747.5	18400.9
26	PERCENTAGE CHANGE		13.65	5.31	9.25	10.94	10.30	10.59	9.43	9.85	9.88	9.87
27												
28	FOOD	TGPFOD	1320.5	1387.7	1472.6	1621.0	1789.7	1971.0	2161.9	2372.6	2602.7	2854.6
29	PERCENTAGE CHANGE		7.77	5.08	6.12	10.08	10.41	10.13	9.69	9.75	9.70	9.68
30												
31	TEXTILES	TGPTEX	482.8	522.8	577.3	631.5	694.9	766.5	842.6	914.0	1009.8	1102.8
32	PERCENTAGE CHANGE		7.38	8.30	10.41	9.39	10.04	10.30	9.93	8.48	10.48	9.22
33												
34	APPAREL	TGPAPP	1154.9	1224.6	1341.3	1482.5	1630.1	1810.3	1965.1	2169.1	2387.6	2621.9
35	PERCENTAGE CHANGE		16.01	6.03	9.53	10.53	9.96	11.05	8.55	10.38	10.07	9.81
36												
37	PAPER	TGPPAP	797.7	862.2	933.0	1030.2	1126.1	1231.8	1320.8	1427.0	1518.9	1629.1
38	PERCENTAGE CHANGE		17.39	8.08	8.21	10.43	9.31	9.38	7.23	8.04	6.43	7.26
39												
40	CHEMICALS	TGPCHM	2576.4	2667.4	2918.9	3284.8	3671.9	4123.8	4571.1	5080.7	5651.2	6287.9
41	PERCENTAGE CHANGE		18.53	3.53	9.43	12.54	11.78	12.30	10.85	11.15	11.23	11.27
42												
43	RUBBER AND PLASTICS	TGPRUB	775.0	794.7	883.2	976.4	1065.7	1169.3	1283.3	1414.7	1557.9	1725.8
44	PERCENTAGE CHANGE		6.15	2.53	11.14	10.55	9.15	9.72	9.75	10.25	10.12	10.77
45												
46	OTHER NONDURABLE GOODS	TGPONR	1036.8	1117.2	1243.6	1368.8	1487.2	1607.3	1730.3	1863.4	2019.4	2178.8
47	PERCENTAGE CHANGE		13.67	7.76	11.32	10.07	8.64	8.08	7.65	7.69	8.37	7.89

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-4: TENNESSEE GROSS STATE PRODUCT BY SECTOR
(Millions of 1972 Dollars)

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	GROSS STATE PRODUCT	TGSP*	26470.1	26467.5	27399.3	28191.6	28990.3	29837.9	30666.2	31638.7	32780.5	33955.4
2	PERCENTAGE CHANGE		1.93	-0.01	3.52	2.89	2.83	2.92	2.78	3.17	3.61	3.58
3												
4	MANUFACTURING	TGPMFG*	9273.9	9126.2	9607.5	10013.3	10433.4	10879.4	11280.0	11754.0	12348.5	12965.5
5	PERCENTAGE CHANGE		1.27	-1.59	5.27	4.22	4.20	4.27	3.68	4.20	5.06	5.00
6												
7	DURABLE GOODS	TGPDUR*	4131.4	4082.5	4384.4	4585.9	4786.4	4980.3	5164.3	5380.5	5666.8	5965.9
8	PERCENTAGE CHANGE		0.94	-1.18	7.39	4.59	4.37	4.05	3.69	4.19	5.32	5.28
9												
10	NONDURABLE GOODS	TGPNDR*	5142.5	5043.6	5223.0	5427.5	5647.0	5899.1	6115.8	6373.5	6681.7	6999.6
11	PERCENTAGE CHANGE		1.53	-1.92	3.56	3.91	4.04	4.46	3.67	4.21	4.83	4.76
12												
13	CONSTRUCTION	TGPCON*	1134.1	1173.4	1232.8	1277.5	1316.1	1352.5	1385.3	1421.7	1462.9	1504.1
14	PERCENTAGE CHANGE		7.38	3.47	5.06	3.62	3.02	2.76	2.43	2.63	2.90	2.82
15												
16	MINING	TGPMIN*	147.4	149.6	158.8	159.6	162.3	165.8	163.9	165.9	170.0	174.4
17	PERCENTAGE CHANGE		1.18	1.46	6.15	0.53	1.65	2.16	-1.12	1.20	2.50	2.55
18												
19	TRADE	TGPTRD*	4315.0	4358.8	4521.9	4654.6	4779.5	4909.9	5046.0	5207.1	5380.0	5551.8
20	PERCENTAGE CHANGE		2.14	1.01	3.74	2.93	2.68	2.73	2.77	3.19	3.32	3.19
21												
22	SERVICES	TGPSER*	2853.3	2883.2	2961.4	3026.9	3091.5	3161.6	3232.6	3325.5	3424.5	3526.6
23	PERCENTAGE CHANGE		3.45	1.05	2.71	2.21	2.13	2.27	2.25	2.87	2.98	2.98
24												
25	FINANCE, INSURANCE & REAL ESTATE	TGPFIR*	3063.5	3056.5	3120.0	3173.6	3214.1	3258.0	3318.8	3391.4	3474.5	3562.8
26	PERCENTAGE CHANGE		2.87	-0.23	2.08	1.72	1.28	1.37	1.87	2.19	2.45	2.54
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TGPTCU*	2164.5	2188.5	2221.4	2259.2	2301.1	2345.8	2394.9	2446.6	2501.1	2560.6
29	PERCENTAGE CHANGE		1.32	1.11	1.50	1.70	1.85	1.94	2.10	2.16	2.23	2.38
30												
31	GOVERNMENT	TGPGOV*	3027.6	3035.0	3074.2	3127.5	3182.9	3244.7	3313.4	3384.4	3466.1	3546.1
32	PERCENTAGE CHANGE		1.42	0.25	1.29	1.73	1.77	1.94	2.12	2.14	2.41	2.31
33												
34	FEDERAL	TGPFG*	1162.6	1152.7	1154.2	1164.9	1180.0	1197.5	1216.5	1236.6	1257.4	1278.0
35	PERCENTAGE CHANGE		-0.46	-0.85	0.13	0.92	1.30	1.49	1.59	1.65	1.68	1.64
36												
37	STATE & LOCAL	TGPSLG*	1865.0	1882.3	1920.0	1962.7	2002.9	2047.1	2096.8	2147.8	2208.7	2268.1
38	PERCENTAGE CHANGE		2.63	0.93	2.00	2.22	2.05	2.21	2.43	2.43	2.84	2.69
39												
40	AGRICULTURE	TGPAG*	490.8	496.3	501.3	499.4	509.5	520.4	531.2	542.2	552.9	563.4
41	PERCENTAGE CHANGE		-6.73	1.12	1.00	-0.38	2.03	2.13	2.07	2.07	1.99	1.90
42												
43	PER CAPITA GROSS STATE PRODUCT ($)	TGSP*PC	6017.	5966.	6133.	6264.	6397.	6536.	6665.	6818.	7002.	7193.
44	PERCENTAGE CHANGE		0.95	-0.85	2.81	2.13	2.12	2.18	1.97	2.30	2.69	2.73

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-5: TENNESSEE MANUFACTURING GROSS PRODUCT
(Millions of 1972 Dollars)

#	DESCRIPTION	MODEL LABEL				FORECAST DATA						
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TOTAL MANUFACTURING	TGPMFG*	9273.9	9126.2	9607.5	10013.3	10433.4	10879.4	11280.0	11754.0	12348.5	12965.5
2	PERCENTAGE CHANGE		1.27	-1.59	5.27	4.22	4.20	4.27	3.68	4.20	5.06	5.00
3												
4	DURABLE GOODS	TGPDUR*	4131.4	4082.5	4384.4	4585.9	4786.4	4980.3	5164.3	5380.5	5666.8	5965.9
5	PERCENTAGE CHANGE		0.94	-1.18	7.39	4.59	4.37	4.05	3.69	4.19	5.32	5.28
6												
7	FURNITURE AND FIXTURES	TGPFUR*	275.8	274.1	302.7	316.1	322.7	338.7	358.9	383.9	405.4	418.5
8	PERCENTAGE CHANGE		-1.35	-0.62	10.42	4.44	2.09	4.97	5.95	6.98	5.58	3.24
9												
10	FABRICATED METALS PRODUCTS	TGPFAB*	550.4	540.8	568.5	592.4	612.3	631.4	653.3	682.5	724.3	777.5
11	PERCENTAGE CHANGE		-1.00	-1.75	5.13	4.20	3.36	3.12	3.47	4.46	6.12	7.35
12												
13	NONELECTRICAL MACHINERY	TGPNEM*	767.4	761.7	808.0	849.8	890.0	922.8	948.9	977.5	1018.6	1077.6
14	PERCENTAGE CHANGE		-0.28	-0.75	6.08	5.18	4.73	3.69	2.82	3.01	4.20	5.79
15												
16	ELECTRICAL MACHINERY	TGPELM*	830.0	811.9	848.7	897.8	955.1	1015.3	1075.4	1136.5	1203.8	1271.6
17	PERCENTAGE CHANGE		0.97	-2.17	4.53	5.78	6.38	6.31	5.91	5.68	5.92	5.64
18												
19	TRANSPORTATION EQUIPMENT	TGPTRE*	560.1	554.6	584.5	616.9	638.5	660.4	673.9	691.4	718.6	750.0
20	PERCENTAGE CHANGE		1.22	-0.99	5.40	5.55	3.50	3.43	2.03	2.60	3.94	4.37
21												
22	OTHER DURABLE GOODS	TGPCDR*	1147.6	1139.5	1272.0	1312.8	1367.8	1411.6	1453.9	1508.7	1596.2	1670.7
23	PERCENTAGE CHANGE		3.18	-0.71	11.63	3.21	4.19	3.20	3.00	3.77	5.80	4.67
24												
25	NONDURABLE GOODS	TGPNDR*	5142.5	5043.6	5223.0	5427.5	5647.0	5899.1	6115.8	6373.5	6681.7	6999.6
26	PERCENTAGE CHANGE		1.53	-1.92	3.56	3.91	4.04	4.46	3.67	4.21	4.83	4.76
27												
28	FOOD	TGPFOD*	875.1	852.9	881.3	916.3	957.1	1000.5	1042.4	1088.3	1139.1	1190.4
29	PERCENTAGE CHANGE		-2.01	-2.54	3.32	3.98	4.45	4.54	4.19	4.41	4.66	4.51
30												
31	TEXTILES	TGPTEX*	308.9	307.2	319.5	325.7	337.2	349.2	361.6	370.8	388.2	403.4
32	PERCENTAGE CHANGE		-3.82	-0.54	4.00	1.94	3.53	3.57	3.56	2.54	4.70	3.91
33												
34	APPAREL	TGPAPP*	845.5	836.5	865.9	892.5	917.8	957.3	979.1	1018.9	1059.8	1100.7
35	PERCENTAGE CHANGE		5.06	-1.06	3.52	3.07	2.84	4.30	2.28	4.06	4.01	3.87
36												
37	PAPER	TGPPAP*	441.7	440.5	454.9	470.2	487.5	504.4	518.4	532.3	551.7	571.6
38	PERCENTAGE CHANGE		3.54	-0.26	3.25	3.37	3.68	3.47	2.77	2.68	3.65	3.61
39												
40	CHEMICALS	TGPCHM*	1535.4	1477.0	1528.2	1608.6	1691.3	1787.5	1871.9	1973.1	2089.9	2214.1
41	PERCENTAGE CHANGE		4.54	-3.81	3.47	5.26	5.14	5.68	4.72	5.41	5.92	5.94
42												
43	RUBBER AND PLASTICS	TGPRUB*	495.2	475.9	496.7	518.2	540.4	564.9	591.4	622.4	660.1	706.4
44	PERCENTAGE CHANGE		-6.33	-3.91	4.39	4.33	4.28	4.53	4.69	5.25	6.06	7.01
45												
46	OTHER NONDURABLE GOODS	TGPCNR*	640.8	653.7	676.6	695.9	715.7	735.3	751.0	767.8	792.9	813.0
47	PERCENTAGE CHANGE		2.99	2.02	3.50	2.85	2.84	2.74	2.14	2.23	3.27	2.54

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-6: TENNESSEE EMPLOYMENT BY SECTOR
(Thousands)

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
#	DESCRIPTION	MODEL LABEL	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	NONAGRICULTURAL JOBS	TETNA	1732.6	1738.9	1763.7	1786.6	1810.2	1835.4	1860.9	1889.1	1921.8	1956.0
2	PERCENTAGE CHANGE		1.42	0.36	1.43	1.30	1.32	1.39	1.39	1.51	1.73	1.78
3												
4	MANUFACTURING	TEMFG	517.5	510.7	518.0	524.8	533.0	542.4	551.5	560.9	572.7	585.0
5	PERCENTAGE CHANGE		-0.92	-1.30	1.43	1.31	1.55	1.78	1.67	1.70	2.12	2.15
6												
7	CONSTRUCTION	TECON	91.1	92.1	93.6	94.9	96.2	97.6	98.9	100.4	102.2	104.0
8	PERCENTAGE CHANGE		6.73	1.09	1.57	1.43	1.38	1.42	1.36	1.52	1.73	1.75
9												
10	MINING	TEMIN	10.4	10.5	11.1	11.1	11.2	11.4	11.4	11.7	12.0	12.4
11	PERCENTAGE CHANGE		0.23	0.92	5.10	0.69	1.03	1.23	0.51	1.86	3.11	3.08
12												
13	TRADE	TETRD	372.8	370.4	371.7	373.5	375.7	378.7	382.5	387.9	394.4	401.5
14	PERCENTAGE CHANGE		1.04	-0.66	0.36	0.50	0.59	0.79	1.01	1.40	1.68	1.80
15												
16	SERVICES	TESER	273.7	281.2	288.2	294.9	301.4	307.8	314.1	320.9	328.0	335.4
17	PERCENTAGE CHANGE		3.74	2.75	2.51	2.32	2.19	2.12	2.07	2.14	2.21	2.27
18												
19	FINANCE, INSURANCE & REAL ESTATE	TEFIR	75.2	75.6	77.0	78.1	79.0	79.8	81.0	82.3	83.9	85.5
20	PERCENTAGE CHANGE		3.07	0.43	1.91	1.43	1.07	1.11	1.46	1.67	1.85	1.90
21												
22	TRANS., COMM. & PUBLIC UTILITIES	TETCU	82.9	83.4	83.9	84.5	85.0	85.6	86.3	87.0	87.7	88.5
23	PERCENTAGE CHANGE		0.93	0.65	0.61	0.64	0.68	0.72	0.77	0.81	0.84	0.88
24												
25	GOVERNMENT	TEGOV	309.0	315.0	320.2	324.7	328.6	332.0	335.1	338.1	341.0	343.8
26	PERCENTAGE CHANGE		2.21	1.95	1.64	1.41	1.20	1.04	0.93	0.88	0.86	0.82
27												
28	FEDERAL, CIVILIAN	TEFG	66.8	66.9	67.1	67.4	67.9	68.5	69.2	70.0	70.9	71.9
29	PERCENTAGE CHANGE		-0.26	0.07	0.30	0.52	0.69	0.85	1.01	1.17	1.32	1.43
30												
31	STATE & LOCAL	TESLG	242.2	248.1	253.1	257.3	260.7	263.6	266.0	268.1	270.1	271.9
32	PERCENTAGE CHANGE		2.92	2.47	2.00	1.65	1.33	1.08	0.91	0.80	0.74	0.66
33												
34	AGRICULTURAL JOBS	TEFARM	113.6	113.0	113.5	113.1	113.4	113.6	114.1	114.6	115.0	115.5
35	PERCENTAGE CHANGE		-2.05	-0.52	0.38	-0.30	0.24	0.22	0.40	0.39	0.42	0.37
36												
37	TOTAL EMPLOYMENT (THOUS. PERSONS)	TNTOT	1870.8	1891.9	1921.1	1943.9	1966.1	1988.9	2011.8	2036.8	2065.7	2095.7
38	PERCENTAGE CHANGE		3.07	1.13	1.54	1.19	1.14	1.16	1.15	1.24	1.42	1.45
39												
40	UNEMPLOYMENT (THOUS. PERSONS)	TNUN	118.4	144.3	141.7	141.7	140.4	138.0	136.7	133.6	128.4	120.8
41	PERCENTAGE CHANGE		6.66	21.86	-1.80	0.05	-0.92	-1.71	-0.98	-2.24	-3.89	-5.98
42												
43	UNEMPLOYMENT RATE (PERCENT)	TNUNR	6.0	7.1	6.9	6.8	6.7	6.5	6.4	6.2	5.9	5.4
44												
45	CIVILIAN LABOR FORCE (THOUS. PERSONS)	TTCLF	1989.2	2036.1	2062.7	2085.6	2106.5	2127.0	2148.5	2170.4	2194.2	2216.5
46	PERCENTAGE CHANGE		3.28	2.36	1.31	1.11	1.00	0.97	1.01	1.02	1.09	1.02

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-7: TENNESSEE MANUFACTURING EMPLOYMENT
(Thousands of Jobs)

#	DESCRIPTION	MODEL LABEL	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
			FORECAST DATA									
1	TOTAL MANUFACTURING	TEMFG	517.5	510.7	518.0	524.8	533.0	542.4	551.5	560.9	572.7	585.0
2	PERCENTAGE CHANGE		-0.92	-1.30	1.43	1.31	1.55	1.78	1.67	1.70	2.12	2.15
3												
4	DURABLE GOODS	TEDUR	231.6	226.9	234.3	239.8	245.2	250.6	255.9	261.4	268.6	276.1
5	PERCENTAGE CHANGE		-2.25	-2.02	3.26	2.33	2.25	2.21	2.13	2.13	2.78	2.78
6												
7	FURNITURES AND FIXTURES	TEFUR	24.9	24.4	26.0	26.2	26.2	26.7	27.5	28.0	28.5	28.7
8	PERCENTAGE CHANGE		-4.28	-2.08	6.78	0.58	0.13	1.82	3.02	1.71	2.06	0.56
9												
10	FABRICATED METAL PRODUCTS	TEFAB	32.1	30.6	31.0	31.7	32.4	33.0	33.7	34.4	35.3	36.5
11	PERCENTAGE CHANGE		-6.88	-4.76	1.22	2.34	2.23	1.97	1.88	2.10	2.72	3.47
12												
13	NONELECTRICAL MACHINERY	TENEM	34.5	33.5	34.4	35.4	36.3	37.0	37.5	38.1	38.9	40.3
14	PERCENTAGE CHANGE		-3.20	-2.88	2.82	2.85	2.57	1.91	1.36	1.50	2.32	3.41
15												
16	ELECTRICAL MACHINERY	TEELM	41.5	40.9	41.5	42.6	43.9	45.4	46.9	48.3	49.9	51.4
17	PERCENTAGE CHANGE		-1.98	-1.41	1.40	2.66	3.24	3.36	3.24	3.12	3.18	3.09
18												
19	TRANSPORTATION EQUIPMENT	TETRE	24.5	24.2	24.4	25.1	25.5	25.9	26.2	26.5	26.9	27.4
20	PERCENTAGE CHANGE		-0.50	-1.13	0.98	2.64	1.59	1.62	1.18	1.06	1.45	1.93
21												
22	OTHER DURABLE GOODS	TEODR	74.2	73.4	77.0	78.9	80.8	82.6	84.2	86.1	89.1	91.8
23	PERCENTAGE CHANGE		0.36	-1.04	4.94	2.42	2.49	2.11	1.97	2.34	3.43	3.04
24												
25	NONDURABLE GOODS	TENDR	285.9	283.8	283.7	285.1	287.8	291.9	295.6	299.5	304.1	308.9
26	PERCENTAGE CHANGE		0.18	-0.72	-0.04	0.47	0.96	1.41	1.27	1.33	1.53	1.58
27												
28	FOOD	TEFOD	38.8	38.2	38.0	38.1	38.5	39.1	39.6	40.1	40.6	41.0
29	PERCENTAGE CHANGE		-2.31	-1.61	-0.48	0.39	1.06	1.54	1.35	1.22	1.14	1.08
30												
31	TEXTILES	TETEX	27.3	26.4	26.1	25.7	25.7	25.9	26.3	26.6	27.1	27.6
32	PERCENTAGE CHANGE		-4.61	-3.05	-1.44	-1.41	0.02	0.89	1.43	1.13	1.73	1.84
33												
34	APPAREL	TEAPP	74.9	75.6	75.8	75.8	75.6	75.8	75.5	75.5	75.5	75.5
35	PERCENTAGE CHANGE		4.03	0.98	0.16	-0.01	-0.23	0.24	-0.31	-0.02	0.03	-0.08
36												
37	PAPER	TEPAP	17.6	17.8	18.0	18.2	18.5	18.9	19.2	19.5	19.8	20.2
38	PERCENTAGE CHANGE		3.71	0.95	1.09	1.37	1.65	1.75	1.64	1.55	1.75	1.85
39												
40	CHEMICALS	TECHM	57.0	55.9	55.5	56.1	57.4	59.1	60.9	62.6	64.5	66.7
41	PERCENTAGE CHANGE		-0.56	-1.98	-0.67	1.05	2.34	3.04	2.95	2.91	3.05	3.31
42												
43	RUBBER AND PLASTICS	TERUB	21.8	21.3	21.3	21.6	22.0	22.6	23.2	24.0	24.8	25.8
44	PERCENTAGE CHANGE		-2.16	-2.39	0.05	1.36	2.06	2.51	2.80	3.13	3.55	4.07
45												
46	OTHER NONDURABLE GOODS	TEOND	48.5	48.7	49.1	49.6	50.0	50.5	50.8	51.2	51.8	52.2
47	PERCENTAGE CHANGE		0.01	0.31	1.01	0.89	0.91	0.89	0.70	0.73	1.07	0.83

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-8: TENNESSEE AVERAGE ANNUAL WAGE AND SALARY BY SECTOR
(Dollars)

#	DESCRIPTION	MODEL LABEL	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
			FORECAST DATA									
1	ALL SECTORS		11891.	12973.	14147.	15436.	16620.	17893.	19233.	20683.	22199.	23829.
2	PERCENTAGE CHANGE		9.07	9.10	9.05	9.11	7.67	7.66	7.49	7.54	7.33	7.35
3												
4	MANUFACTURING	TWMFG	12753.	13940.	15208.	16580.	17834.	19172.	20574.	22084.	23655.	25339.
5	PERCENTAGE CHANGE		9.60	9.31	9.10	9.02	7.56	7.50	7.31	7.34	7.11	7.12
6												
7	DURABLE GOODS	TWDUR	12898.	14235.	15553.	16888.	18107.	19422.	20799.	22285.	23815.	25458.
8	PERCENTAGE CHANGE		9.80	10.36	9.26	8.58	7.22	7.26	7.09	7.14	6.87	6.90
9												
10	NONDURABLE GOODS	TWNDR	12634.	13703.	14922.	16321.	17602.	18957.	20379.	21909.	23515.	25232.
11	PERCENTAGE CHANGE		9.46	8.46	8.90	9.37	7.85	7.70	7.50	7.51	7.33	7.30
12												
13	CONSTRUCTION	TWCCN	12607.	13818.	15147.	16616.	17985.	19462.	21026.	22723.	24502.	26418.
14	PERCENTAGE CHANGE		9.58	9.61	9.62	9.70	8.24	8.21	8.03	8.07	7.83	7.82
15												
16	MINING	TWMIN	15826.	17395.	19147.	21130.	22952.	24967.	27145.	29574.	32169.	35036.
17	PERCENTAGE CHANGE		8.85	9.92	10.07	10.35	8.62	8.78	8.72	8.95	8.78	8.91
18												
19	TRADE	TWTRD	9842.	10755.	11729.	12780.	13741.	14764.	15834.	16984.	18179.	19456.
20	PERCENTAGE CHANGE		9.59	9.28	9.05	8.96	7.52	7.44	7.25	7.27	7.03	7.03
21												
22	SERVICES	TWSER	10502.	11379.	12330.	13370.	14324.	15344.	16415.	17568.	18766.	20048.
23	PERCENTAGE CHANGE		8.31	8.35	8.36	8.43	7.13	7.12	6.98	7.03	6.82	6.83
24												
25	FINANCE, INSURANCE & REAL ESTATE	TWFIR	12647.	13776.	15043.	16468.	17800.	19252.	20803.	22501.	24292.	26235.
26	PERCENTAGE CHANGE		8.54	8.93	9.20	9.47	8.08	8.16	8.06	8.16	7.96	8.00
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TWTCU	17400.	19148.	21051.	23142.	25077.	27162.	29366.	31759.	34267.	36973.
29	PERCENTAGE CHANGE		10.16	10.04	9.94	9.94	8.36	8.31	8.11	8.15	7.90	7.90
30												
31	GOVERNMENT	TWGOV	12734.	13824.	15043.	16413.	17691.	19092.	20594.	22246.	23995.	25899.
32	PERCENTAGE CHANGE		8.40	8.56	8.82	9.11	7.79	7.92	7.87	8.02	7.86	7.94
33												
34	FEDERAL, CIVILIAN	TWFG	20289.	22206.	24331.	26693.	28876.	31242.	33755.	36498.	39384.	42512.
35	PERCENTAGE CHANGE		9.68	9.45	9.57	9.71	8.18	8.19	8.04	8.13	7.91	7.94
36												
37	STATE & LOCAL	TWSLG	10648.	11565.	12582.	13719.	14779.	15936.	17172.	18526.	19955.	21505.
38	PERCENTAGE CHANGE		8.39	8.61	8.79	9.04	7.72	7.83	7.76	7.89	7.71	7.77
39												
40	AGRICULTURE	TWFAR	4121.	4516.	4964.	5482.	5951.	6484.	7077.	7763.	8523.	9398.
41	PERCENTAGE CHANGE		9.45	9.60	9.90	10.45	8.55	8.96	9.14	9.70	9.79	10.27

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-9: TENNESSEE MANUFACTURING AVERAGE ANNUAL WAGE AND SALARY
(Dollars)

#	DESCRIPTION	MODEL LABEL	FORECAST DATA 1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TOTAL MANUFACTURING	TWMFG	12753.	13940.	15208.	16580.	17834.	19172.	20574.	22084.	23655.	25339.
2	PERCENTAGE CHANGE		9.60	9.31	9.10	9.02	7.56	7.50	7.31	7.34	7.11	7.12
3												
4	DURABLE GOODS	TWDUR	12898.	14235.	15553.	16888.	18107.	19422.	20799.	22285.	23815.	25458.
5	PERCENTAGE CHANGE		9.80	10.36	9.26	8.58	7.22	7.26	7.09	7.14	6.87	6.90
6												
7	FURNITURES AND FIXTURES	TWFUR	10005.	11196.	12226.	13344.	14504.	15676.	16880.	18423.	19862.	21502.
8	PERCENTAGE CHANGE		14.00	11.91	9.20	9.15	8.70	8.08	7.68	9.14	7.81	8.26
9												
10	FABRICATED METALS	TWFAB	13160.	14487.	15800.	17062.	18196.	19562.	21022.	22496.	23973.	25609.
11	PERCENTAGE CHANGE		8.91	10.08	9.06	7.99	6.65	7.51	7.46	7.01	6.56	6.82
12												
13	NONELECTRICAL MACHINERY	TWNEM	14231.	15679.	17152.	18528.	19834.	21253.	22775.	24403.	25948.	27757.
14	PERCENTAGE CHANGE		8.58	10.17	9.40	8.02	7.05	7.15	7.16	7.15	6.33	6.98
15												
16	ELECTRICAL MACHINERY	TWELM	11742.	12939.	14188.	15472.	16634.	17914.	19272.	20694.	22125.	23636.
17	PERCENTAGE CHANGE		11.17	10.19	9.65	9.05	7.51	7.70	7.58	7.38	6.92	6.83
18												
19	TRANSPORTATION EQUIPMENT	TWTRE	14471.	15997.	17575.	19308.	20824.	22466.	24211.	26091.	28136.	30265.
20	PERCENTAGE CHANGE		10.73	10.55	9.86	9.86	7.85	7.88	7.77	7.76	7.84	7.57
21												
22	OTHER DURABLE GOODS	TWODR	13265.	14623.	15957.	17253.	18408.	19631.	20898.	22240.	23728.	25212.
23	PERCENTAGE CHANGE		8.57	10.24	9.12	8.12	6.70	6.64	6.45	6.42	6.69	6.25
24												
25	NONDURABLE GOODS	TWNDR	12634.	13703.	14922.	16321.	17602.	18957.	20379.	21909.	23515.	25232.
26	PERCENTAGE CHANGE		9.46	8.46	8.90	9.37	7.85	7.70	7.50	7.51	7.33	7.30
27												
28	FOOD	TWFOD	13890.	15071.	16322.	17951.	19255.	20691.	22223.	23786.	25489.	27241.
29	PERCENTAGE CHANGE		10.55	8.50	8.30	9.98	7.26	7.46	7.41	7.03	7.16	6.87
30												
31	TEXTILES	TWTEX	10207.	11178.	12290.	13659.	14858.	16208.	17615.	19120.	20795.	22474.
32	PERCENTAGE CHANGE		10.55	9.52	9.94	11.14	8.78	9.09	8.68	8.55	8.76	8.07
33												
34	APPAREL	TWAPP	7705.	8468.	9324.	10272.	11298.	12345.	13486.	14728.	16080.	17579.
35	PERCENTAGE CHANGE		11.67	9.90	10.11	10.17	9.98	9.27	9.24	9.21	9.18	9.32
36												
37	PAPER	TWPAP	16538.	179[illegible].	19411.	20975.	22527.	24071.	25532.	27121.	28719.	30480.
38	PERCENTAGE CHANGE		10.55	8.56	8.12	8.06	7.40	6.85	6.07	6.22	5.89	6.13
39												
40	CHEMICALS	TWCHM	18538.	19887.	21422.	23211.	24722.	26382.	28112.	30039.	32027.	34053.
41	PERCENTAGE CHANGE		7.49	7.28	7.72	8.35	6.51	6.71	6.56	6.85	6.62	6.32
42												
43	RUBBER AND PLASTICS	TWRUB	15518.	16628.	17928.	19395.	20701.	22075.	23511.	25143.	26665.	28463.
44	PERCENTAGE CHANGE		6.36	7.15	7.82	6.18	6.73	6.64	6.50	6.94	6.06	6.74
45												
46	OTHER NONDURABLE GOODS	TWOND	10956.	12208.	13583.	14846.	15907.	16950.	17980.	19041.	20120.	21280.
47	PERCENTAGE CHANGE		13.88	11.43	11.26	9.30	7.14	6.56	6.07	5.90	5.67	5.77

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-10: TENNESSEE AVERAGE ANNUAL WAGE AND SALARY BY SECTOR
(1972 Dollars)

#	DESCRIPTION	MODEL LABEL	1979	1980	FORECAST DATA 1981	1982	1983	1984	1985	1986	1987	1988
1	ALL SECTORS		7264.	7297.	7426.	7578.	7669.	7779.	7889.	8001.	8114.	8248.
2	PERCENTAGE CHANGE		-0.06	0.45	1.78	2.04	1.21	1.43	1.41	1.43	1.40	1.66
4	MANUFACTURING	TWMFG*	7790.	7840.	7983.	8139.	8230.	8336.	8439.	8543.	8646.	8771.
5	PERCENTAGE CHANGE		0.43	0.64	1.82	1.96	1.11	1.28	1.24	1.24	1.20	1.44
7	DURABLE GOODS	TWDUR*	7879.	8006.	8164.	8291.	8356.	8444.	8531.	8621.	8704.	8812.
8	PERCENTAGE CHANGE		0.61	1.61	1.97	1.55	0.79	1.06	1.03	1.05	0.97	1.24
10	NONDURABLE GOODS	TWNDR*	7718.	7707.	7833.	8012.	8123.	8242.	8359.	8476.	8595.	8734.
11	PERCENTAGE CHANGE		0.30	-0.14	1.64	2.29	1.38	1.47	1.41	1.40	1.40	1.62
13	CONSTRUCTION	TWCON*	7701.	7772.	7951.	8157.	8299.	8462.	8624.	8790.	8955.	9144.
14	PERCENTAGE CHANGE		0.41	0.92	2.31	2.59	1.74	1.96	1.92	1.93	1.88	2.11
16	MINING	TWMIN*	9667.	9784.	10051.	10373.	10592.	10855.	11134.	11440.	11758.	12127.
17	PERCENTAGE CHANGE		-0.26	1.20	2.74	3.20	2.11	2.49	2.57	2.75	2.77	3.14
19	TRADE	TWTRD*	6012.	6049.	6157.	6274.	6341.	6419.	6495.	6570.	6644.	6735.
20	PERCENTAGE CHANGE		0.42	0.61	1.78	1.90	1.07	1.23	1.18	1.17	1.13	1.36
22	SERVICES	TWSER*	6415.	6400.	6473.	6564.	6610.	6671.	6733.	6796.	6859.	6939.
23	PERCENTAGE CHANGE		-0.76	-0.24	1.14	1.41	0.70	0.93	0.92	0.94	0.93	1.17
25	FINANCE, INSURANCE & REAL ESTATE	TWFIR*	7726.	7748.	7897.	8085.	8214.	8371.	8533.	8705.	8879.	9081.
26	PERCENTAGE CHANGE		-0.54	0.29	1.92	2.38	1.60	1.91	1.94	2.01	2.00	2.28
28	TRANS., COMM. & PUBLIC UTILITIES	TWTCU*	10629.	10769.	11050.	11361.	11572.	11810.	12045.	12286.	12524.	12798.
29	PERCENTAGE CHANGE		0.94	1.32	2.61	2.81	1.86	2.05	1.99	2.00	1.94	2.18
31	GOVERNMENT	TWGOV*	7779.	7775.	7897.	8057.	8164.	8301.	8447.	8606.	8770.	8965.
32	PERCENTAGE CHANGE		-0.67	-0.05	1.57	2.04	1.32	1.68	1.76	1.88	1.91	2.22
34	FEDERAL, CIVILIAN	TWFG*	12394.	12489.	12772.	13104.	13325.	13583.	13845.	14119.	14395.	14715.
35	PERCENTAGE CHANGE		0.50	0.77	2.26	2.60	1.69	1.94	1.93	1.98	1.95	2.23
37	STATE & LOCAL	TWSLG*	6505.	6504.	6605.	6735.	6820.	6929.	7043.	7167.	7294.	7444.
38	PERCENTAGE CHANGE		-0.68	-0.01	1.54	1.97	1.26	1.59	1.66	1.75	1.77	2.06
40	AGRICULTURE	TWFAR*	2517.	2540.	2606.	2691.	2746.	2819.	2903.	3003.	3115.	3253.
41	PERCENTAGE CHANGE		0.29	0.91	2.58	3.29	2.04	2.65	2.97	3.46	3.73	4.43

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-11: TENNESSEE MANUFACTURING AVERAGE ANNUAL WAGE AND SALARY (1972 Dollars)

#	DESCRIPTION	MODEL LABEL				FORECAST DATA						
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TOTAL MANUFACTURING	TWMFG*	7790.	7840.	7983.	8139.	8230.	8336.	8439.	8543.	8646.	8771.
2	PERCENTAGE CHANGE		0.43	0.64	1.82	1.96	1.11	1.28	1.24	1.24	1.20	1.44
3												
4	DURABLE GOODS	TWDUR*	7879.	8006.	8164.	8291.	8356.	8444.	8531.	8621.	8704.	8812.
5	PERCENTAGE CHANGE		0.61	1.61	1.97	1.55	0.79	1.06	1.03	1.05	0.97	1.24
6												
7	FURNITURE AND FIXTURES	TWFUR*	6112.	6297.	6418.	6551.	6693.	6816.	6924.	7127.	7260.	7443.
8	PERCENTAGE CHANGE		4.46	3.03	1.92	2.07	2.18	1.83	1.59	2.93	1.86	2.52
9												
10	FABRICATED METAL PRODUCTS	TWFAB*	8039.	8148.	8294.	8376.	8397.	8505.	8623.	8703.	8762.	8864.
11	PERCENTAGE CHANGE		-0.21	1.35	1.79	0.99	0.25	1.29	1.38	0.93	0.68	1.17
12												
13	NONELECTRICAL MACHINERY	TWNEM*	8693.	8818.	9004.	9096.	9153.	9240.	9342.	9440.	9484.	9608.
14	PERCENTAGE CHANGE		-0.51	1.44	2.11	1.02	0.62	0.96	1.10	1.05	0.46	1.31
15												
16	ELECTRICAL MACHINERY	TWELM*	7173.	7277.	7448.	7595.	7676.	7789.	7905.	8005.	8087.	8182.
17	PERCENTAGE CHANGE		1.87	1.46	2.34	1.98	1.06	1.47	1.49	1.27	1.01	1.17
18												
19	TRANSPORTATION EQUIPMENT	TWTRE*	8840.	8997.	9226.	9478.	9609.	9768.	9931.	10093.	10284.	10476.
20	PERCENTAGE CHANGE		1.47	1.78	2.54	2.74	1.38	1.65	1.67	1.63	1.89	1.87
21												
22	OTHER DURABLE GOODS	TWODR*	8103.	8224.	8376.	8470.	8495.	8535.	8572.	8604.	8673.	8727.
23	PERCENTAGE CHANGE		-0.52	1.50	1.85	1.11	0.30	0.48	0.43	0.37	0.80	0.63
24												
25	NONDURABLE GOODS	TWNDR*	7718.	7707.	7833.	8012.	8123.	8242.	8359.	8476.	8595.	8734.
26	PERCENTAGE CHANGE		0.30	-0.14	1.64	2.29	1.38	1.47	1.41	1.40	1.40	1.62
27												
28	FOOD	TWFOD*	8485.	8476.	8568.	8812.	8885.	8996.	9115.	9202.	9316.	9429.
29	PERCENTAGE CHANGE		1.30	-0.10	1.08	2.85	0.83	1.24	1.33	0.95	1.24	1.21
30												
31	TEXTILES	TWTEX*	6235.	6287.	6451.	6706.	6857.	7047.	7225.	7397.	7601.	7779.
32	PERCENTAGE CHANGE		1.30	0.83	2.61	3.94	2.25	2.78	2.52	2.37	2.76	2.35
33												
34	APPAREL	TWAPP*	4707.	4762.	4894.	5043.	5213.	5367.	5531.	5697.	5877.	6085.
35	PERCENTAGE CHANGE		2.32	1.18	2.77	3.03	3.38	2.95	3.06	3.00	3.16	3.53
36												
37	PAPER	TWPAP*	10103.	10098.	10189.	10297.	10395.	10466.	10472.	10492.	10497.	10550.
38	PERCENTAGE CHANGE		1.30	-0.05	0.91	1.05	0.96	0.67	0.07	0.18	0.05	0.51
39												
40	CHEMICALS	TWCHM*	11324.	11185.	11245.	11395.	11408.	11470.	11531.	11621.	11706.	11787.
41	PERCENTAGE CHANGE		-1.51	-1.23	0.54	1.33	0.12	0.54	0.53	0.78	0.73	0.69
42												
43	RUBBER AND PLASTICS	TWRUB*	9480.	9352.	9411.	9521.	9553.	9598.	9643.	9726.	9746.	9852.
44	PERCENTAGE CHANGE		-2.54	-1.35	0.63	1.17	0.33	0.47	0.47	0.86	0.20	1.09
45												
46	OTHER NONDURABLE GOODS	TWOND*	6693.	6866.	7130.	7288.	7341.	7370.	7375.	7366.	7354.	7366.
47	PERCENTAGE CHANGE		4.35	2.59	3.84	2.22	0.72	0.40	0.07	-0.12	-0.16	0.16

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-12: TENNESSEE PERSONAL INCOME BY COMPONENTS

#	DESCRIPTION	MODEL LABEL				FORECAST DATA						
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TOTAL PERSONAL INCOME (MIL $)	TPYC01	31797.8	35098.3	38933.7	42906.2	46965.2	51274.7	55903.3	61144.2	67053.8	73500.1
2	PERCENTAGE CHANGE		11.46	10.38	10.93	10.20	9.46	9.18	9.03	9.37	9.66	9.61
3												
4	WAGES AND SALARIES	TPY002	21092.8	23083.0	25524.2	28198.2	30759.4	33575.1	36593.9	39949.5	43620.3	47653.8
5	PERCENTAGE CHANGE		10.62	9.44	10.58	10.48	9.08	9.15	8.99	9.17	9.19	9.25
6												
7	OTHER LABOR INCOME	TPYC47	2073.4	2308.7	2561.8	2844.3	3145.6	3483.6	3839.8	4252.4	4695.7	5243.9
8	PERCENTAGE CHANGE		12.70	11.35	10.96	11.03	10.59	10.74	10.22	10.75	10.43	11.67
9												
10	PROPRIETORS' INCOME	TPYC52	2334.8	2629.6	2916.0	3205.4	3514.1	3820.4	4126.1	4459.7	4830.5	5229.0
11	PERCENTAGE CHANGE		15.32	12.63	10.89	9.92	9.63	8.71	8.00	8.08	8.32	8.25
12												
13	PROPERTY INCOME	TPY065	3768.7	4225.0	4806.5	5426.8	6006.1	6603.6	7232.5	8111.1	9203.8	10309.0
14	PERCENTAGE CHANGE		14.45	12.11	13.76	12.91	10.67	9.95	9.52	12.15	13.47	12.01
15												
16	TRANSFER PAYMENTS	TPYC73	4331.9	4871.5	5415.4	5930.7	6576.4	7195.7	7917.2	8730.1	9605.8	10538.7
17	PERCENTAGE CHANGE		11.19	12.46	11.16	9.51	10.89	9.42	10.03	10.27	10.03	9.71
18												
19	LESS: PERS. CONT. FOR SOCIAL INS.	TPY103	1438.4	1604.5	1815.2	2153.9	2410.9	2687.3	2988.6	3429.5	3851.4	4290.8
20	PERCENTAGE CHANGE		13.47	11.54	13.14	18.66	11.93	11.47	11.21	14.75	12.30	11.41
21												
22	RESIDENCE ADJUSTMENT	TPY104	-365.3	-415.1	-475.0	-545.1	-625.6	-716.3	-817.4	-928.9	-1050.9	-1183.3
23	PERCENTAGE CHANGE		12.14	13.61	14.43	14.77	14.75	14.51	14.12	13.64	13.13	12.60
24												
25	PER CAPITA PERSONAL INCOME ($)	TPYPC	7228.	7911.	8715.	9534.	10363.	11231.	12149.	13177.	14322.	15570.
26	PERCENTAGE CHANGE		10.39	9.45	10.16	9.39	8.70	8.38	8.17	8.46	8.69	8.71
27												
28	TOTAL PERSONAL INCOME (MIL 72 $)	TPYC01*	19424.4	19740.3	20437.6	21063.4	21672.9	22293.4	22930.0	23653.5	24508.0	25441.4
29	PERCENTAGE CHANGE		2.14	1.63	3.53	3.06	2.89	2.86	2.86	3.16	3.61	3.81
30												
31	PER CAPITA PERSONAL INCOME (72 $)	TPYPC*	4415.	4450.	4575.	4680.	4782.	4883.	4983.	5097.	5235.	5389.
32	PERCENTAGE CHANGE		1.16	0.77	2.82	2.30	2.17	2.11	2.05	2.29	2.70	2.95
33												
34	TN INDIVIDUAL IRS COLLECTIONS (MIL $)	TTRVIRS	3421.2	3884.8	4564.1	5182.5	5803.1	6415.3	7090.2	7712.9	8599.8	9696.9
35	PERCENTAGE CHANGE		13.08	13.55	17.49	13.55	11.98	10.55	10.52	8.78	11.50	12.76
36												
37	DISPOSABLE PERSONAL INCOME (MIL $)	TDPY	28376.7	31213.5	34369.5	37723.7	41162.0	44859.4	48813.1	53431.3	58454.0	63803.2
38	PERCENTAGE CHANGE		11.27	10.00	10.11	9.76	9.11	8.98	8.81	9.46	9.40	9.15
39												
40	PER CAPITA DISPOSABLE INCOME ($)	TDPYPC	6450.	7036.	7694.	8382.	9082.	9826.	10608.	11515.	12486.	13516.
41	PERCENTAGE CHANGE		10.21	9.07	9.35	8.95	8.35	8.19	7.96	8.54	8.43	8.25
42												
43	DISPOSABLE INCOME (MIL 72 $)	TDPY*	17334.5	17555.4	18041.7	18519.2	18994.9	19504.1	20021.8	20669.8	21364.8	22084.9
44	PERCENTAGE CHANGE		1.96	1.27	2.77	2.65	2.57	2.68	2.65	3.24	3.36	3.37
45												
46	PER CAPITA DISPOSABLE INCOME (72 $)	TDPYPC*	3940.	3957.	4039.	4115.	4191.	4272.	4351.	4454.	4563.	4678.
47	PERCENTAGE CHANGE		0.98	0.42	2.06	1.89	1.85	1.93	1.85	2.37	2.45	2.52

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-13: TENNESSEE RETAIL SALES

#	DESCRIPTION	MODEL LABEL	FORECAST DATA 1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	TOTAL (MIL $)	TRSTOT	17107.3	18337.7	20481.3	22511.0	24565.3	26753.9	29071.7	31766.8	34668.1	37733.1
2	PERCENTAGE CHANGE		8.88	7.19	11.69	9.91	9.13	8.91	8.66	9.27	9.13	8.84
3												
4	AUTOMOTIVE	TRSAUT	3638.4	3809.8	4416.5	4846.8	5286.6	5759.5	6264.2	6855.6	7495.5	8174.5
5	PERCENTAGE CHANGE		0.27	4.71	15.93	9.74	9.07	8.95	8.76	9.44	9.33	9.06
6												
7	NONAUTOMOTIVE	TRSNAUT	13468.9	14527.9	16064.7	17664.1	19278.8	20994.4	22807.5	24911.2	27172.6	29558.6
8	PERCENTAGE CHANGE		11.47	7.86	10.58	9.96	9.14	8.90	8.64	9.22	9.08	8.78
9												
10												
11	TOTAL (MIL 72 $)	TRSTOT*	10450.4	10313.7	10751.3	11051.0	11336.1	11632.1	11924.4	12288.9	12671.1	13061.0
12	PERCENTAGE CHANGE		-0.23	-1.31	4.24	2.79	2.58	2.61	2.51	3.06	3.11	3.08
13												
14	AUTOMOTIVE	TRSAUT*	2222.6	2142.8	2318.4	2379.4	2439.6	2504.1	2569.4	2652.1	2739.6	2829.5
15	PERCENTAGE CHANGE		-8.12	-3.59	8.20	2.63	2.53	2.65	2.61	3.22	3.30	3.28
16												
17	NONAUTOMOTIVE	TRSNAUT*	8227.8	8170.9	8432.9	8671.6	8896.5	9128.0	9355.0	9636.8	9931.5	10231.4
18	PERCENTAGE CHANGE		2.14	-0.69	3.21	2.83	2.59	2.60	2.49	3.01	3.06	3.02

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-14: TENNESSEE ENERGY CONSUMPTION -- SELECTED CATEGORIES

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	ELECTRICITY (MIL. KWH)		52214.	52682.	54676.	56480.	58576.	60614.	62676.	64879.	67016.	69513.
2	PERCENTAGE CHANGE		2.68	0.90	3.79	3.30	3.71	3.48	3.40	3.51	3.29	3.73
3												
4	RESIDENTIAL	TECRES	26681.	27474.	28399.	29326.	30314.	31303.	32317.	33340.	34365.	35448.
5	PERCENTAGE CHANGE		3.26	2.97	3.37	3.26	3.37	3.26	3.24	3.17	3.08	3.15
6												
7	COMMERCIAL	TECC	4328.	4329.	4452.	4549.	4656.	4783.	4879.	4998.	5152.	5310.
8	PERCENTAGE CHANGE		1.92	0.03	2.84	2.18	2.35	2.74	1.99	2.44	3.09	3.06
9												
10	INDUSTRIAL	TECI	21206.	20879.	21825.	22604.	23606.	24528.	25480.	26541.	27498.	28755.
11	PERCENTAGE CHANGE		2.11	-1.54	4.53	3.57	4.43	3.91	3.88	4.16	3.61	4.57
12												
13	TOTAL GAS (MIL. THERMS)		1906.	1908.	1912.	1915.	1912.	1916.	1920.	1912.	1909.	1913.
14	PERCENTAGE CHANGE		0.18	0.07	0.23	0.16	-0.15	0.22	0.16	-0.41	-0.15	0.23
15												
16	RESIDENTIAL	TTGSRES	487.	487.	485.	482.	479.	476.	473.	469.	465.	464.
17	PERCENTAGE CHANGE		0.01	-0.06	-0.38	-0.54	-0.70	-0.67	-0.64	-0.87	-0.70	-0.36
18												
19	COMMERCIAL	TTGSCCM	377.	375.	374.	373.	372.	371.	370.	368.	366.	366.
20	PERCENTAGE CHANGE		-0.56	-0.43	-0.27	-0.24	-0.25	-0.33	-0.25	-0.49	-0.57	-0.13
21												
22	INDUSTRIAL	TTGSIND	1042.	1046.	1053.	1060.	1061.	1070.	1077.	1075.	1077.	1084.
23	PERCENTAGE CHANGE		0.52	0.32	0.69	0.62	0.13	0.82	0.65	-0.17	0.23	0.61
24												
25	COAL (THOUS. TONS)	TCCCN	21610.	21789.	21992.	22185.	22409.	22592.	22793.	23141.	22964.	22887.
26	PERCENTAGE CHANGE		4.81	0.83	0.94	0.88	1.01	0.82	0.89	1.53	-0.77	-0.34
27												
28	GASOLINE (MIL. GAL.)	TGASO	2599.	2604.	2599.	2599.	2605.	2617.	2634.	2657.	2680.	2706.
29	PERCENTAGE CHANGE		0.42	0.17	-0.17	-0.01	0.23	0.45	0.67	0.88	0.86	0.94
30												
31	FUEL OIL (THOUS. BARRELS)	TFOIL	25016.	25111.	25689.	25968.	26172.	26116.	26398.	26654.	27084.	27591.
32	PERCENTAGE CHANGE		1.89	0.38	2.30	1.08	0.79	-0.22	1.08	0.97	1.61	1.88

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-15: TENNESSEE ENERGY CONSUMPTION
(Trillions of BTU's)

#	DESCRIPTION	MODEL				FORECAST DATA						
		LABEL	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	ELECTRICITY	TFEAELECCCN	269.5	272.2	282.6	293.4	305.1	316.8	328.7	340.9	352.9	365.4
2	PERCENTAGE CHANGE		1.47	1.00	3.84	3.80	3.98	3.86	3.76	3.69	3.52	3.56
3												
4	RESIDENTIAL	TFEAELCRES	91.3	93.0	95.4	98.0	100.8	103.6	106.6	109.6	112.6	115.7
5	PERCENTAGE CHANGE		1.59	1.88	2.55	2.65	2.86	2.83	2.85	2.81	2.74	2.82
6												
7	COMMERCIAL	TFEAELCCOM	17.0	16.4	16.4	16.5	16.7	17.0	17.2	17.4	17.8	18.2
8	PERCENTAGE CHANGE		-5.21	-3.30	0.05	0.53	1.10	1.59	1.22	1.59	2.07	2.07
9												
10	INDUSTRIAL	TFEAELCIND	161.2	162.7	170.8	178.9	187.6	196.3	205.0	213.9	222.5	231.5
11	PERCENTAGE CHANGE		2.15	0.95	4.95	4.76	4.86	4.62	4.45	4.33	4.04	4.05
12												
13	NATURAL GAS	TFEANGASCCN	230.5	229.0	228.4	228.1	227.4	227.5	227.6	226.6	226.1	226.4
14	PERCENTAGE CHANGE		-0.38	-0.67	-0.23	-0.14	-0.33	0.06	0.04	-0.46	-0.22	0.15
15												
16	RESIDENTIAL	TFEANGCRES	50.7	50.7	50.5	50.3	50.0	49.7	49.4	49.0	48.7	48.6
17	PERCENTAGE CHANGE		3.56	-0.05	-0.34	-0.49	-0.63	-0.60	-0.57	-0.78	-0.62	-0.33
18												
19	COMMERCIAL	TFEANGCCOM	45.1	45.0	44.9	44.8	44.7	44.6	44.5	44.3	44.1	44.0
20	PERCENTAGE CHANGE		-1.05	-0.36	-0.22	-0.20	-0.21	-0.27	-0.21	-0.40	-0.47	-0.11
21												
22	INDUSTRIAL	TFEANGCIND	105.2	104.4	104.4	104.7	104.7	105.3	105.9	105.7	105.9	106.5
23	PERCENTAGE CHANGE		-1.59	-0.79	0.05	0.26	-0.03	0.64	0.53	-0.17	0.19	0.53
24												
25	OTHER	TFEANGCOTH	29.5	28.9	28.6	28.4	28.1	28.0	27.9	27.6	27.4	27.4
26	PERCENTAGE CHANGE		-1.49	-1.81	-1.07	-0.85	-1.05	-0.40	-0.38	-1.07	-0.66	-0.06
27												
28	COAL	TFEACOALCCN	602.1	604.6	607.5	610.1	613.2	615.8	618.5	623.3	620.9	619.8
29	PERCENTAGE CHANGE		-4.70	0.42	0.47	0.44	0.51	0.41	0.45	0.77	-0.39	-0.17
30												
31	FUEL OIL	TFEAFOILCCN	164.1	164.1	166.9	168.2	169.1	168.7	170.1	171.4	173.7	176.3
32	PERCENTAGE CHANGE		1.12	0.01	1.69	0.75	0.55	-0.25	0.85	0.77	1.31	1.54
33												
34	GASOLINE	TFEAGASCCCN	325.2	325.7	325.2	325.1	325.9	327.3	329.4	332.2	335.0	338.1
35	PERCENTAGE CHANGE		0.23	0.17	-0.16	-0.01	0.23	0.44	0.65	0.85	0.84	0.92
36												
37	OTHER	TFEAOTHRCCN	195.7	196.1	197.8	199.4	201.2	202.9	205.0	207.2	208.8	210.8
38	PERCENTAGE CHANGE		0.55	0.24	0.86	0.81	0.88	0.86	1.01	1.09	0.76	0.94
39												
40												
41	TOTAL ENERGY CONSUMPTION	TFEATOTLCCN	1787.0	1791.7	1808.4	1824.4	1841.8	1859.0	1879.4	1901.7	1917.4	1936.9
42	PERCENTAGE CHANGE		-1.27	0.26	0.93	0.88	0.96	0.93	1.10	1.18	0.83	1.02
43												
44	GROSS ENERGY CONSUMPTION		1517.6	1519.6	1525.8	1531.0	1536.8	1542.2	1550.7	1560.8	1564.5	1571.5
45	PERCENTAGE CHANGE		-1.74	0.13	0.41	0.34	0.38	0.35	0.55	0.65	0.24	0.45
46												
47	NET ENERGY CONSUMPTION		1073.4	1072.4	1067.2	1060.6	1053.7	1046.5	1042.3	1039.6	1030.8	1024.9
48	PERCENTAGE CHANGE		0.62	-0.09	-0.49	-0.61	-0.65	-0.69	-0.40	-0.26	-0.85	-0.58

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-16: TENNESSEE ENERGY PRICES

#	DESCRIPTION	MODEL LABEL	1979	1980	1981	FORECAST DATA 1982	1983	1984	1985	1986	1987	1988
1	ELECTRICITY (CENTS/KILOWATT-HOUR)		3.16	3.49	3.86	4.24	4.61	4.96	5.28	5.66	6.04	6.38
2	PERCENTAGE CHANGE		14.86	10.55	10.46	9.88	8.86	7.43	6.63	7.19	6.60	5.72
3												
4	RESIDENTIAL	TEPRES	3.12	3.45	3.79	4.16	4.49	4.81	5.12	5.47	5.81	6.12
5	PERCENTAGE CHANGE		13.86	10.54	10.04	9.68	7.98	7.10	6.47	6.76	6.19	5.42
6												
7	COMMERCIAL	TEPC	3.92	4.33	4.78	5.27	5.73	6.14	6.60	7.07	7.51	7.98
8	PERCENTAGE CHANGE		13.91	10.46	10.51	10.12	8.78	7.23	7.34	7.15	6.24	6.22
9												
10	INDUSTRIAL	TEPI	3.05	3.37	3.75	4.13	4.54	4.91	5.23	5.64	6.05	6.41
11	PERCENTAGE CHANGE		16.43	10.58	11.09	10.15	10.10	7.92	6.72	7.78	7.18	5.97
12												
13												
14	TOTAL GAS (CENTS/THERM)		20.0	22.4	25.1	28.3	31.4	34.7	38.1	43.2	48.3	52.4
15	PERCENTAGE CHANGE		13.18	11.96	12.06	12.42	11.28	10.24	9.79	13.42	11.95	8.36
16												
17	RESIDENTIAL	TTGPRES	21.7	23.9	26.7	29.9	33.2	36.6	40.1	44.5	48.8	52.3
18	PERCENTAGE CHANGE		12.19	10.43	11.54	12.06	11.18	10.17	9.46	11.04	9.64	7.23
19												
20	COMMERCIAL	TTGPCOM	22.8	25.3	28.1	31.2	34.3	37.5	40.9	46.2	51.6	55.9
21	PERCENTAGE CHANGE		12.37	10.89	11.01	11.02	10.01	9.30	9.09	12.87	11.76	8.29
22												
23	INDUSTRIAL	TTGPIND	18.3	20.7	23.4	26.5	29.6	32.8	36.2	41.6	47.0	51.2
24	PERCENTAGE CHANGE		14.20	13.35	12.89	13.28	11.90	10.74	10.31	14.82	13.13	8.91
25												
26	COAL PRICE ($/TON)	TCPR	28.91	32.04	35.59	40.34	43.99	47.10	49.89	53.41	57.68	62.35
27	PERCENTAGE CHANGE		8.86	10.80	11.08	13.35	9.06	7.05	5.93	7.06	8.00	8.09
28												
29	GASOLINE PRICE INDEX (1967=100)	UPIGAS	420.1	555.7	677.5	749.9	813.7	882.0	951.7	1025.9	1105.1	1174.8
30	PERCENTAGE CHANGE		45.51	32.28	21.92	10.69	8.51	8.39	7.90	7.80	7.72	6.31
31												
32	FUEL OIL PRICE INDEX (1967=100)	UPIMDIST	522.6	639.6	757.9	858.7	923.1	994.2	1071.8	1156.4	1246.6	1342.6
33	PERCENTAGE CHANGE		31.31	22.39	18.50	13.30	7.50	7.70	7.81	7.89	7.80	7.70

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-17: TENNESSEE COMMERCIAL BANKS AND SAVINGS AND LOANS ASSETS AND LIABILITIES (Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
			FORECAST DATA									
1	COMMERCIAL BANKS											
2	ASSETS		22574.5	24182.2	26092.5	29150.5	32034.4	35211.1	39236.2	43946.1	49491.2	55927.6
3	PERCENTAGE CHANGE		11.37	7.12	7.90	11.72	9.89	9.92	11.43	12.00	12.62	13.01
4												
5	TOTAL LOANS	TTLOAN	12853.1	13862.7	14981.6	16863.7	18651.4	20626.8	23110.7	26035.9	29468.6	33437.3
6	PERCENTAGE CHANGE		7.71	7.86	8.07	12.56	10.60	10.59	12.04	12.66	13.18	13.47
7												
8	SECURITIES AND OTHER INVESTMENTS	TINVSECCAST	9721.4	10319.5	11111.0	12286.8	13383.0	14584.3	16125.5	17910.2	20022.6	22490.3
9	PERCENTAGE CHANGE		16.61	6.15	7.67	10.58	8.92	8.98	10.57	11.07	11.79	12.32
10												
11	LIABILITIES											
12	TOTAL DEPOSITS	TDEPTOT	19057.0	20281.5	21902.0	24309.4	26553.9	29013.4	32168.9	35823.0	40148.0	45200.6
13	PERCENTAGE CHANGE		8.68	6.43	7.99	10.99	9.23	9.26	10.88	11.36	12.07	12.58
14												
15	DEMAND DEPOSITS	TDEPDEM	6732.3	7184.3	7805.1	8679.4	9524.7	10432.8	11442.8	12506.5	13647.4	15037.8
16	PERCENTAGE CHANGE		8.13	6.71	8.64	11.20	9.74	9.53	9.68	9.30	9.12	10.19
17												
18	TIME DEPOSITS	TDEPTIM	12324.6	13097.2	14096.9	15630.0	17029.2	18580.6	20726.1	23316.5	26500.6	30162.8
19	PERCENTAGE CHANGE		8.99	6.27	7.63	10.88	8.95	9.11	11.55	12.50	13.66	13.82
20												
21	AVERAGE YIELDS (PERCENT)											
22	LOANS	TNCBLOANINT	10.19	10.49	10.13	9.83	9.60	9.30	9.17	9.00	8.77	8.63
23	PERCENTAGE CHANGE		5.36	2.96	-3.40	-2.98	-2.33	-3.19	-1.40	-1.78	-2.58	-1.56
24												
25	SECURITIES	TNCBSECINTR	6.31	6.37	6.38	6.26	6.12	5.94	5.86	5.71	5.55	5.45
26	PERCENTAGE CHANGE		0.37	0.91	0.18	-1.99	-2.12	-3.02	-1.36	-2.56	-2.83	-1.66
27												
28												
29	SAVINGS AND LOANS											
30	ASSETS		6816.5	7229.0	7802.9	8692.5	9439.3	10201.8	11230.8	12364.6	13662.4	15045.4
31	PERCENTAGE CHANGE		6.64	6.05	7.94	11.40	8.59	8.08	10.09	10.10	10.50	10.12
32												
33	TOTAL LOANS	TSLTLOAN	5906.2	6264.0	6762.0	7533.8	8181.8	8843.4	9736.3	10720.1	11846.1	13046.1
34	PERCENTAGE CHANGE		6.40	6.06	7.95	11.41	8.60	8.09	10.10	10.10	10.50	10.13
35												
36	SECURITIES AND OTHER INVESTMENTS	TSLSOINV	910.4	964.9	1040.9	1158.6	1257.4	1358.4	1494.5	1644.6	1816.3	1999.3
37	PERCENTAGE CHANGE		8.20	6.00	7.87	11.31	8.53	8.02	10.03	10.04	10.44	10.08
38												
39	LIABILITIES											
40	TIME DEPOSITS	TSLSC	5761.5	6106.0	6585.4	7328.3	7952.0	8588.9	9448.3	10395.2	11479.1	12634.2
41	PERCENTAGE CHANGE		8.89	5.98	7.85	11.28	8.51	8.01	10.01	10.02	10.43	10.06

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-18: TENNESSEE AGRICULTURAL OUTPUT
(Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
						FORECAST DATA						
1	CASH RECEIPTS	TCRTOT	1750.6	1891.4	2016.5	2176.8	2357.5	2544.3	2738.2	2944.3	3154.9	3375.3
2	PERCENTAGE CHANGE		7.70	8.04	6.62	7.95	8.30	7.92	7.62	7.53	7.15	6.99
3												
4	CROPS	TCRCRPS	764.1	834.1	898.9	965.4	1035.0	1105.0	1176.6	1251.4	1326.6	1404.5
5	PERCENTAGE CHANGE		0.93	9.16	7.77	7.39	7.21	6.77	6.48	6.36	6.01	5.87
6												
7	MEAT ANIMALS	TCRMEAT	643.5	688.6	726.3	791.3	871.9	956.8	1045.7	1141.0	1239.3	1343.3
8	PERCENTAGE CHANGE		14.05	7.01	5.47	8.95	10.18	9.74	9.29	9.12	8.61	8.39
9												
10	DAIRY PRODUCTS	TCRCAIR	236.3	254.3	269.9	287.6	305.5	323.9	343.1	363.8	385.1	406.8
11	PERCENTAGE CHANGE		9.25	7.58	6.16	6.56	6.21	6.02	5.94	6.02	5.85	5.64
12												
13	POULTRY AND EGGS	TCRPEGG	106.6	114.4	121.4	132.5	145.2	158.5	172.7	188.0	203.9	220.8
14	PERCENTAGE CHANGE		22.30	7.26	6.15	9.15	9.56	9.21	8.94	8.85	8.44	8.28
15												
16	EXPENSES	TFRMEXP	770.9	841.8	906.6	984.5	1043.7	1102.7	1162.1	1222.9	1283.7	1345.7
17	PERCENTAGE CHANGE		9.76	9.19	7.70	8.59	6.02	5.65	5.39	5.23	4.98	4.83
18												
19	GROSS OUTPUT	TGPFRM	979.6	1049.6	1109.9	1192.3	1313.8	1441.6	1576.0	1721.4	1871.2	2029.6
20	PERCENTAGE CHANGE		6.14	7.14	5.75	7.42	10.19	9.73	9.33	9.22	8.70	8.47
21												
22	GROSS OUTPUT (MIL 72 $)	TGPAG*	490.8	496.3	501.3	499.4	509.5	520.4	531.2	542.2	552.9	563.4
23	PERCENTAGE CHANGE		-6.73	1.12	1.00	-0.38	2.03	2.13	2.07	2.07	1.99	1.90

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

CONTROL SOLUTION: NOVEMBER 15, 1979

TABLE A-19: TENNESSEE EXOGENOUS ASSUMPTIONS

#	DESCRIPTION	MODEL LABEL	FORECAST DATA									
			1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	OTHER INDUSTRIES WAGES & SALARIES	TPYC04	41.8	47.0	52.8	58.8	64.6	70.7	77.3	84.7	92.5	100.8
2	MILITARY WAGES AND SALARIES	TPYC46	170.1	182.4	195.1	214.7	235.1	257.6	282.4	309.2	338.0	369.0
3												
4	INTERGOVERNMENTAL REVENUE TO STATE	TTRVIGR	926.5	978.7	1042.8	1165.0	1258.7	1384.5	1553.0	1670.6	1853.2	2004.8
5	TAX RATES											
6	ALCOHOLIC SPIRITS	TTRRALC	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
7	SALES & USE	TTRRSU	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
8	TOBACCO	TTRRTOB	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
9	CORPORATION EXCISE	TTRRCE	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
10												
11	TIME	TIME	79.	80.	81.	82.	83.	84.	85.	86.	87.	88.
12	DUMMY MEMPHIS IN TVA SYSTEM	CUMMEP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	DUMMY PROPERTY ASSESSMENT CHANGE	INC3AS	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
14	WEIGHTED PROPERTY TAX RATE	TLPTAXWTRT	2.93	2.96	2.99	3.02	3.05	3.08	3.11	3.14	3.17	3.20
15	DUMMY FOOD STAMP	DUMFS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
16												
17	INTERGOVERNMENTAL REV FED TO LOCAL	TLGGRIRGFED	325.1	343.4	365.9	408.8	441.7	485.8	544.9	586.5	650.6	703.8
18												
19	CATTLE AND CALVES MARKETINGS	TCMKT	902.1	883.6	884.1	914.6	970.6	1032.9	1096.7	1162.3	1228.1	1294.2
20	CHICKENS AND BROILER PRODUCTION	TCHRBRL	187.2	185.7	184.0	183.6	184.2	185.1	186.0	187.0	188.0	188.8

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

APPENDIX B

TENNESSEE ECONOMETRIC MODEL
HISTORICAL DATA (1969-1978)

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-1: TENNESSEE SELECTED INDICATORS

# DESCRIPTION	MODEL LABEL	HISTORICAL DATA									
		1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1 TN GROSS STATE PRODUCT (MIL. DOL.)	TGSP	15836.4	16793.4	18481.8	21005.7	23916.1	26025.8	27257.6	30807.1	34459.4	39278.6
2 PERCENTAGE CHANGE		8.86	6.04	10.05	13.66	13.86	8.82	4.73	13.02	11.86	13.99
3											
4 TN GROSS STATE PRODUCT (MIL 72 $)	TGSP*	18063.3	18244.5	19158.5	21005.6	22747.4	22528.3	21549.5	23125.8	24449.2	25968.6
5 PERCENTAGE CHANGE		4.16	1.00	5.01	9.64	8.29	-0.96	-4.34	7.31	5.72	6.21
6											
7 US GROSS NATIONAL PRODUCT (BIL 72 $)	GNP*	1078.8	1075.3	1107.5	1171.1	1235.0	1217.8	1202.3	1273.0	1340.5	1399.2
8 PERCENTAGE CHANGE		2.57	-0.32	2.99	5.74	5.46	-1.39	-1.27	5.88	5.30	4.38
9											
10 TN PERSONAL INCOME (MIL. DOL.)	TPY001	11210.3	12120.5	13282.6	14968.1	16908.0	18736.7	20124.5	22626.1	25211.7	28527.5
11 PERCENTAGE CHANGE		8.69	8.12	9.59	12.69	12.96	10.82	7.41	12.43	11.43	13.15
12											
13 TN PERSONAL INCOME (MIL 72 $)		12667.0	13103.2	13750.1	14968.1	16026.5	16028.0	15921.3	17037.7	17957.1	19018.3
14 PERCENTAGE CHANGE		3.90	3.44	4.94	8.86	7.07	0.01	-0.67	7.01	5.40	5.91
15											
16 US PERSONAL INCOME (BIL 72 $)		842.7	866.2	889.3	942.5	997.5	987.9	993.3	1040.4	1090.9	1144.9
17 PERCENTAGE CHANGE		4.05	2.79	2.67	5.98	5.84	-0.96	0.54	4.74	4.86	4.95
18											
19 TN EMPLOYED PERSONS (THOUS)	TNTCT	1514.7	1573.0	1586.0	1662.0	1683.0	1729.0	1658.0	1723.0	1783.0	1815.0
20 PERCENTAGE CHANGE		2.19	3.85	0.83	4.79	1.26	2.73	-4.11	3.92	3.48	1.79
21											
22 US EMPLOYED PERSONS (THOUS)	UNTCT	77902.	78627.	79119.	81702.	84409.	85935.	84783.	87485.	90546.	94373.
23 PERCENTAGE CHANGE		2.61	0.93	0.63	3.26	3.31	1.81	-1.34	3.19	3.50	4.23
24											
25 TN UNEMPLOYMENT RATE	TNUNR	4.1	4.3	4.7	3.7	3.9	5.1	8.3	6.0	6.3	5.8
26											
27 US UNEMPLOYMENT RATE	UEUNR	3.5	4.9	5.9	5.6	4.9	5.6	8.5	7.7	7.0	6.0
28											
29 IMPLICIT DEFLATOR, GSP	UDGSP	87.7	92.0	96.5	100.0	105.1	115.5	126.5	133.2	140.9	151.3
30 PERCENTAGE CHANGE		4.51	4.99	4.80	3.66	5.14	9.88	9.49	5.32	5.80	7.32
31											
32 IMPLICIT DEFLATOR, GNP	UDGNP	86.7	91.4	96.0	100.0	105.8	116.0	127.1	133.7	141.7	152.0
33 PERCENTAGE CHANGE		5.03	5.35	5.10	4.14	5.80	9.64	9.57	5.19	5.98	7.27
34											
35 TN MFG OUTPUT / EMPLOYEE (THOUS 72 $)		13.7	14.0	14.7	15.8	16.5	16.2	16.0	16.6	17.1	17.5
36 PERCENTAGE CHANGE		2.60	2.38	5.15	7.18	4.83	-1.93	-1.30	3.82	3.00	2.46
37											
38 US MFG OUTPUT / EMPLOYEE (THOUS 72 $)		13.7	13.5	14.2	15.1	15.5	14.5	15.1	16.0	16.6	16.8
39 PERCENTAGE CHANGE		0.96	-1.77	5.43	6.30	2.99	-6.38	4.02	5.64	3.80	1.32
40											
41 TN PER CAPITA INCOME ($)	TPYPC	2813.	3083.	3329.	3713.	4129.	4516.	4823.	5344.	5874.	6548.
42 PERCENTAGE CHANGE		7.78	9.60	7.98	11.53	11.20	9.37	6.80	10.80	9.92	11.47
43											
44 TN POPULATION (THOUS.)	TPOP	3985.	3932.	3990.	4031.	4095.	4149.	4173.	4234.	4292.	4357.
45 PERCENTAGE CHANGE		0.83	-1.33	1.48	1.03	1.59	1.32	0.58	1.46	1.37	1.51

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-2: TENNESSEE GROSS STATE PRODUCT BY SECTOR
(Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	GROSS STATE PRODUCT	TGSP	15836.4	16793.4	18481.8	21005.7	23916.1	26025.8	27257.6	30807.1	34459.4	39278.6
2	PERCENTAGE CHANGE		8.86	6.04	10.05	13.66	13.86	8.82	4.73	13.02	11.86	13.99
3												
4	MANUFACTURING	TGPMFG	5982.3	6297.4	6728.2	7715.7	8772.5	9563.3	9289.5	10723.9	12111.9	13543.1
5	PERCENTAGE CHANGE		7.56	5.27	6.84	14.68	13.70	9.01	-2.86	15.44	12.94	11.82
6												
7	DURABLE GOODS	TGPDUR	2524.0	2610.2	2795.8	3328.5	3856.6	4191.6	3762.7	4653.4	5474.5	6377.3
8	PERCENTAGE CHANGE		11.75	3.41	7.11	19.05	15.87	8.69	-10.23	23.67	17.64	16.49
9												
10	NONDURABLE GOODS	TGPNDR	3458.3	3687.2	3932.4	4387.2	4915.9	5371.6	5526.8	6070.5	6637.4	7165.8
11	PERCENTAGE CHANGE		4.69	6.62	6.65	11.57	12.05	9.27	2.89	9.84	9.34	7.96
12												
13	CONSTRUCTION	TGPCON	683.6	676.8	797.7	905.6	1077.1	1161.7	1173.8	1247.3	1381.2	1593.7
14	PERCENTAGE CHANGE		9.59	-1.00	17.86	13.53	18.94	7.86	1.04	6.26	10.74	15.38
15												
16	MINING	TGPMIN	97.3	122.7	135.0	140.6	158.6	257.1	302.4	242.8	318.4	385.6
17	PERCENTAGE CHANGE		-2.37	26.08	9.99	4.17	12.76	62.09	17.64	-19.73	31.16	21.10
18												
19	TRADE	TGPTRD	2530.4	2661.7	2995.2	3421.5	3914.0	4222.7	4665.6	5244.1	5630.8	6375.3
20	PERCENTAGE CHANGE		8.99	5.19	12.53	14.23	14.39	7.89	10.49	12.40	8.33	12.22
21												
22	SERVICES	TGPSER	1546.1	1693.9	1848.9	2070.9	2392.7	2601.3	2882.0	3228.9	3575.4	4162.0
23	PERCENTAGE CHANGE		11.30	9.56	9.15	12.01	15.54	8.72	10.79	12.04	10.73	16.41
24												
25	FINANCE, INSURANCE & REAL ESTATE	TGPFIR	1829.5	1948.5	2197.9	2457.1	2702.9	2968.4	3223.6	3616.0	4079.4	4493.8
26	PERCENTAGE CHANGE		8.20	6.50	12.80	11.79	10.00	9.83	8.59	12.17	12.81	10.16
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TGPTCU	1077.1	1144.8	1293.1	1480.2	1678.1	1831.9	1974.5	2279.6	2614.0	3033.7
29	PERCENTAGE CHANGE		9.59	6.29	12.95	14.47	13.37	9.17	7.79	15.45	14.67	16.06
30												
31	GOVERNMENT	TGPGOV	1682.1	1816.1	2013.7	2277.2	2493.2	2776.2	3117.7	3450.1	3949.7	4568.5
32	PERCENTAGE CHANGE		10.02	7.97	10.88	13.08	9.48	11.35	12.30	10.66	14.48	15.67
33												
34	FEDERAL	TGPFG	676.2	718.6	781.0	881.9	923.5	1031.2	1159.9	1306.4	1478.8	1775.4
35	PERCENTAGE CHANGE		8.25	6.27	8.69	12.92	4.71	11.66	12.48	12.63	13.20	20.06
36												
37	STATE & LOCAL	TGPSLG	1005.9	1097.5	1232.7	1395.3	1569.7	1745.0	1957.8	2143.7	2471.0	2793.1
38	PERCENTAGE CHANGE		11.24	9.11	12.31	13.19	12.50	11.17	12.20	9.50	15.27	13.04
39												
40	AGRICULTURE	TGPAG	408.0	431.9	471.4	536.9	727.0	642.8	628.8	774.2	748.6	923.0
41	PERCENTAGE CHANGE		10.60	5.85	9.14	13.90	35.42	-11.59	-2.18	23.13	-3.31	23.30
42												
43	PER CAPITA GROSS STATE PRODUCT ($)	TGSPPC	3974.	4271.	4632.	5211.	5840.	6273.	6532.	7276.	8029.	9015.
44	PERCENTAGE CHANGE		7.96	7.47	8.45	12.50	12.08	7.40	4.13	11.39	10.34	12.28

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-3: TENNESSEE MANUFACTURING GROSS PRODUCT

(Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL MANUFACTURING	TGPMFG	5982.3	6297.4	6728.2	7715.7	8772.5	9563.3	9289.5	10723.9	12111.9	13543.1
2	PERCENTAGE CHANGE		7.56	5.27	6.84	14.68	13.70	9.01	-2.86	15.44	12.94	11.82
3												
4	DURABLE GOODS	TGPDUR	2524.0	2610.2	2795.8	3328.5	3856.6	4191.6	3762.7	4653.4	5474.5	6377.3
5	PERCENTAGE CHANGE		11.75	3.41	7.11	19.05	15.87	8.69	-10.23	23.67	17.64	16.49
6												
7	FURNITURE AND FIXTURES	TGPFUR	199.9	205.4	228.9	291.2	305.6	291.9	263.6	327.4	363.2	411.3
8	PERCENTAGE CHANGE		4.88	2.75	11.44	27.22	4.94	-4.49	-9.69	24.20	10.93	13.24
9												
10	FABRICATED METAL PRODUCTS	TGPFAB	320.5	327.4	351.7	443.3	533.0	575.5	635.7	704.9	810.0	923.5
11	PERCENTAGE CHANGE		17.06	2.15	7.42	26.04	20.23	7.97	10.46	10.89	14.91	14.01
12												
13	NONELECTRICAL MACHINERY	TGPNEM	320.7	418.0	436.4	546.7	689.7	816.1	715.2	882.1	1045.4	1233.6
14	PERCENTAGE CHANGE		34.41	30.34	4.40	25.27	26.16	18.32	-12.36	23.34	18.51	18.01
15												
16	ELECTRICAL MACHINERY	TGPELM	533.8	531.9	620.7	684.1	726.7	637.5	612.8	775.5	1001.5	1183.8
17	PERCENTAGE CHANGE		-7.57	-0.36	16.70	10.21	6.23	-12.28	-3.87	26.55	29.14	18.20
18												
19	TRANSPORTATION EQUIPMENT	TGPTRE	251.8	311.3	304.9	352.1	383.0	521.5	343.7	524.7	606.8	737.7
20	PERCENTAGE CHANGE		26.85	23.63	-2.06	15.48	8.78	36.16	-34.09	52.66	15.65	21.57
21												
22	OTHER DURABLE GOODS	TGPODR	897.3	816.2	853.2	1011.1	1218.6	1349.2	1191.7	1438.8	1647.6	1887.5
23	PERCENTAGE CHANGE		15.08	-9.04	4.53	18.51	20.52	10.72	-11.67	20.74	14.51	14.56
24												
25	NONDURABLE GOODS	TGPNDR	3458.3	3687.2	3932.4	4387.2	4915.9	5371.6	5526.8	6070.5	6637.4	7165.8
26	PERCENTAGE CHANGE		4.69	6.62	6.65	11.57	12.05	9.27	2.89	9.84	9.34	7.96
27												
28	FOOD	TGPFOD	535.3	612.7	641.2	697.9	796.3	925.2	983.3	1118.2	1175.9	1225.3
29	PERCENTAGE CHANGE		0.36	14.46	4.65	8.84	14.10	16.19	6.28	13.72	5.16	4.20
30												
31	TEXTILES	TGPTEX	298.6	308.9	349.1	342.5	373.3	383.1	346.1	369.2	416.4	449.6
32	PERCENTAGE CHANGE		3.18	3.45	13.01	-1.89	8.99	2.64	-9.67	6.67	12.78	7.98
33												
34	APPAREL	TGPAPP	413.9	463.7	461.9	586.3	645.7	636.6	653.2	818.8	909.1	995.5
35	PERCENTAGE CHANGE		-6.36	12.03	-0.39	26.93	10.13	-1.40	2.60	25.35	11.03	9.50
36												
37	PAPER	TGPPAP	255.9	272.3	300.2	358.5	432.4	503.0	466.5	549.2	616.7	679.6
38	PERCENTAGE CHANGE		6.98	6.41	10.25	19.42	20.61	16.34	-7.26	17.73	12.29	10.19
39												
40	CHEMICALS	TGPCHM	1312.9	1300.0	1383.1	1425.0	1568.5	1708.7	1827.3	1919.0	2052.0	2173.7
41	PERCENTAGE CHANGE		2.27	-0.98	6.39	3.03	10.07	8.94	6.94	5.02	6.93	5.93
42												
43	RUBBER AND PLASTICS	TGPRUB	219.9	263.7	300.9	425.0	481.2	488.1	471.7	490.7	625.9	730.2
44	PERCENTAGE CHANGE		65.59	19.92	14.11	41.24	13.22	1.43	-3.36	4.03	27.55	16.66
45												
46	OTHER NONDURABLE GOODS	TGPONR	421.8	465.9	496.0	552.0	618.5	726.8	778.7	805.4	841.4	912.0
47	PERCENTAGE CHANGE		10.22	10.46	6.46	11.29	12.05	17.51	7.14	3.43	4.47	8.40

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-4: TENNESSEE GROSS STATE PRODUCT BY SECTOR
(Millions of 1972 Dollars)

#	DESCRIPTION	MODEL LABEL	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
			HISTORICAL DATA									
1	GROSS STATE PRODUCT	TGSP*	18063.3	18244.5	19158.5	21005.6	22747.4	22528.3	21549.5	23125.8	24449.2	25968.6
2	PERCENTAGE CHANGE		4.16	1.00	5.01	9.64	8.29	-0.96	-4.34	7.31	5.72	6.21
3												
4	MANUFACTURING	TGPMFG*	6424.3	6501.7	6776.4	7715.7	8587.4	8322.9	7345.9	8076.5	8667.6	9157.9
5	PERCENTAGE CHANGE		5.91	1.21	4.23	13.86	11.30	-3.08	-11.74	9.95	7.32	5.66
6												
7	DURABLE GOODS	TGPDUR*	2806.3	2776.0	2861.6	3328.5	3743.8	3697.5	2935.7	3482.1	3791.6	4092.8
8	PERCENTAGE CHANGE		8.73	-1.08	3.08	16.31	12.48	-1.24	-20.60	18.61	8.89	7.94
9												
10	NONDURABLE GOODS	TGPNDR*	3618.0	3725.7	3914.8	4387.2	4843.6	4625.5	4410.2	4594.4	4876.0	5065.1
11	PERCENTAGE CHANGE		3.83	2.98	5.08	12.07	10.40	-4.50	-4.65	4.18	6.13	3.88
12												
13	CONSTRUCTION	TGPCON*	790.4	740.6	827.5	905.6	1019.0	1007.6	927.9	938.5	979.6	1056.1
14	PERCENTAGE CHANGE		3.07	-6.30	11.73	9.43	12.52	-1.12	-7.91	1.14	4.38	7.81
15												
16	MINING	TGPMIN*	112.7	134.2	147.0	140.6	142.1	153.4	149.3	109.8	131.2	145.7
17	PERCENTAGE CHANGE		-4.36	19.05	9.53	-4.32	1.04	7.93	-2.68	-26.41	19.43	11.08
18												
19	TRADE	TGPTRD*	2925.6	2912.7	3107.2	3421.5	3702.9	3662.3	3688.3	3945.9	4029.0	4224.8
20	PERCENTAGE CHANGE		2.51	-0.44	6.68	10.12	8.22	-1.10	0.71	6.98	2.11	4.86
21												
22	SERVICES	TGPSER*	1787.5	1853.6	1918.0	2070.9	2263.7	2256.1	2278.3	2429.5	2535.7	2758.1
23	PERCENTAGE CHANGE		4.68	3.70	3.48	7.97	9.31	-0.33	0.98	6.64	4.37	8.77
24												
25	FINANCE, INSURANCE & REAL ESTATE	TGPFIR*	2115.2	2132.3	2280.0	2457.1	2557.1	2574.5	2548.3	2720.9	2893.2	2978.0
26	PERCENTAGE CHANGE		1.76	0.81	6.93	7.76	4.07	0.68	-1.02	6.77	6.33	2.93
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TGPTCU*	1246.6	1277.7	1354.0	1480.2	1650.0	1683.7	1670.5	1789.3	1940.6	2136.4
29	PERCENTAGE CHANGE		5.91	2.49	5.97	9.32	11.47	2.04	-0.79	7.11	8.46	10.09
30												
31	GOVERNMENT	TGPGOV*	2175.9	2137.2	2189.4	2277.2	2355.8	2437.1	2510.5	2584.0	2762.1	2985.3
32	PERCENTAGE CHANGE		3.84	-1.78	2.44	4.01	3.45	3.45	3.01	2.93	6.89	8.08
33												
34	FEDERAL	TGPFG*	931.2	884.4	879.5	881.9	888.3	907.8	939.2	983.0	1041.4	1168.0
35	PERCENTAGE CHANGE		2.51	-5.02	-0.55	0.27	0.72	2.19	3.46	4.66	5.94	12.16
36												
37	STATE & LOCAL	TGPSLG*	1244.7	1252.7	1309.8	1395.3	1467.5	1529.3	1571.3	1601.0	1720.7	1817.3
38	PERCENTAGE CHANGE		4.86	0.65	4.56	6.52	5.18	4.22	2.74	1.89	7.48	5.61
39												
40	AGRICULTURE	TGPAG*	485.1	518.5	558.9	536.9	469.4	430.8	430.7	531.4	510.3	526.2
41	PERCENTAGE CHANGE		1.13	6.88	7.79	-3.94	-12.57	-8.22	-0.03	23.38	-3.97	3.12
42												
43	PER CAPITA GROSS STATE PRODUCT ($)	TGSP*PC	4533.	4640.	4802.	5211.	5555.	5430.	5164.	5462.	5696.	5960.
44	PERCENTAGE CHANGE		3.29	2.36	3.48	8.53	6.60	-2.25	-4.89	5.77	4.29	4.63

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-5: TENNESSEE MANUFACTURING GROSS PRODUCT
(Millions of 1972 Dollars)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL MANUFACTURING	TGPMFG*	6424.3	6501.7	6776.4	7715.7	8587.4	8322.9	7345.9	8076.5	8667.6	9157.9
2	PERCENTAGE CHANGE		5.91	1.21	4.23	13.86	11.30	-3.08	-11.74	9.95	7.32	5.66
3												
4	DURABLE GOODS	TGPDUR*	2806.3	2776.0	2861.6	3328.5	3743.8	3697.5	2935.7	3482.1	3791.6	4092.8
5	PERCENTAGE CHANGE		8.73	-1.08	3.08	16.31	12.48	-1.24	-20.60	18.61	8.89	7.94
6												
7	FURNITURE AND FIXTURES	TGPFUR*	211.3	200.0	225.1	291.2	297.3	258.3	212.9	261.1	264.3	279.6
8	PERCENTAGE CHANGE		1.56	-5.36	12.54	29.37	2.09	-13.11	-17.57	22.62	1.24	5.78
9												
10	FABRICATED METALS PRODUCTS	TGPFAB*	368.0	352.8	362.2	443.3	508.6	478.8	445.8	476.0	527.3	556.0
11	PERCENTAGE CHANGE		14.50	-4.12	2.66	22.39	14.73	-5.86	-6.89	6.77	10.79	5.43
12												
13	NONELECTRICAL MACHINERY	TGPNEM*	349.7	438.6	443.5	546.7	675.5	739.2	567.2	656.3	705.4	769.6
14	PERCENTAGE CHANGE		30.16	25.42	1.11	23.27	23.56	9.43	-23.27	15.72	7.48	9.10
15												
16	ELECTRICAL MACHINERY	TGPELM*	576.5	553.5	623.2	684.1	723.8	611.2	513.2	629.0	743.0	822.1
17	PERCENTAGE CHANGE		-7.37	-3.98	12.59	9.77	5.80	-15.56	-16.03	22.55	18.13	10.65
18												
19	TRANSPORTATION EQUIPMENT	TGPTRE*	266.5	315.1	301.0	352.1	377.0	494.3	287.6	422.5	474.1	553.4
20	PERCENTAGE CHANGE		24.30	18.25	-4.47	16.98	7.06	31.13	-41.82	46.89	12.21	16.74
21												
22	OTHER DURABLE GOODS	TGPODR*	1024.3	916.0	906.7	1011.1	1161.7	1116.0	909.0	1037.3	1077.6	1112.3
23	PERCENTAGE CHANGE		8.25	-10.57	-1.02	11.51	14.89	-3.94	-18.55	14.12	3.88	3.22
24												
25	NONDURABLE GOODS	TGPNDR*	3618.0	3725.7	3914.8	4387.2	4843.6	4625.5	4410.2	4594.4	4876.0	5065.1
26	PERCENTAGE CHANGE		3.83	2.98	5.08	12.07	10.40	-4.50	-4.65	4.18	6.13	3.88
27												
28	FOOD	TGPFOD*	559.4	609.1	615.9	697.9	772.3	759.0	720.9	845.8	896.3	893.1
29	PERCENTAGE CHANGE		-1.85	8.89	1.13	13.31	10.67	-1.73	-5.02	17.33	5.97	-0.36
30												
31	TEXTILES	TGPTEX*	290.7	312.0	351.2	342.5	357.9	311.5	291.6	287.8	309.3	321.1
32	PERCENTAGE CHANGE		-1.14	7.33	12.56	-2.48	4.50	-12.97	-6.40	-1.31	7.50	3.81
33												
34	APPAREL	TGPAPP*	418.1	446.3	449.8	586.3	686.9	617.5	614.5	730.4	763.3	804.7
35	PERCENTAGE CHANGE		-11.56	6.75	0.77	30.36	17.16	-10.10	-0.49	18.87	4.51	5.42
36												
37	PAPER	TGPPAP*	269.9	265.7	301.7	358.5	424.3	419.9	333.9	370.3	403.9	426.6
38	PERCENTAGE CHANGE		7.77	-1.58	13.56	18.83	18.37	-1.05	-20.47	10.90	9.05	5.63
39												
40	CHEMICALS	TGPCHM*	1360.5	1330.6	1388.7	1425.0	1546.8	1478.1	1383.3	1360.0	1434.0	1468.7
41	PERCENTAGE CHANGE		3.43	-2.20	4.36	2.62	8.55	-4.44	-6.42	-1.68	5.44	2.42
42												
43	RUBBER AND PLASTICS	TGPRUB*	246.0	278.2	308.0	425.0	478.8	435.8	409.5	403.9	459.9	528.7
44	PERCENTAGE CHANGE		65.03	13.09	10.72	37.99	12.66	-8.98	-6.04	-1.37	13.87	14.97
45												
46	OTHER NONDURABLE GOODS	TGPONR*	473.4	483.8	499.5	552.0	576.4	603.7	656.6	596.2	609.3	622.1
47	PERCENTAGE CHANGE		9.35	2.20	3.24	10.51	4.42	4.72	8.77	-9.20	2.20	2.11

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-6: TENNESSEE EMPLOYMENT BY SECTOR
(Thousands)

#	DESCRIPTION	MODEL LABEL	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
			HISTORICAL DATA									
1	NONAGRICULTURAL JOBS	TETNA	1309.8	1327.6	1356.8	1450.1	1531.1	1558.2	1505.7	1575.4	1628.7	1708.3
2	PERCENTAGE CHANGE		3.62	1.36	2.20	6.88	5.59	1.77	-3.37	4.63	3.38	4.89
3												
4	MANUFACTURING	TEMFG	470.0	464.6	460.5	489.2	519.4	513.3	459.0	486.1	506.5	522.3
5	PERCENTAGE CHANGE		3.23	-1.15	-0.88	6.23	6.17	-1.17	-10.58	5.90	4.20	3.12
6												
7	CONSTRUCTION	TECCN	66.5	63.1	68.0	78.6	86.1	87.8	76.0	73.8	75.6	85.4
8	PERCENTAGE CHANGE		3.26	-5.11	7.77	15.59	9.54	1.97	-13.44	-2.89	2.44	12.96
9												
10	MINING	TEMIN	6.8	7.0	7.0	7.1	7.0	8.3	9.5	9.4	9.2	10.4
11	PERCENTAGE CHANGE		-2.86	2.94	0.0	1.43	-1.41	18.57	14.46	-1.05	-2.13	13.04
12												
13	TRADE	TETRD	254.8	258.6	270.1	294.3	312.0	321.0	320.8	339.5	349.8	369.0
14	PERCENTAGE CHANGE		3.75	1.49	4.45	8.96	6.01	2.88	-0.06	5.83	3.03	5.49
15												
16	SERVICES	TESER	175.8	185.1	193.0	209.8	221.9	227.6	229.4	240.5	250.5	263.8
17	PERCENTAGE CHANGE		4.46	5.29	4.27	8.70	5.77	2.57	0.79	4.84	4.16	5.31
18												
19	FINANCE, INSURANCE & REAL ESTATE	TEFIR	56.1	57.2	59.2	61.2	66.1	69.5	68.9	69.3	70.4	73.0
20	PERCENTAGE CHANGE		6.45	1.96	3.50	3.38	8.01	5.14	-0.86	0.58	1.59	3.69
21												
22	TRANS., COMM. & PUBLIC UTILITIES	TETCU	65.7	66.1	67.0	69.3	72.4	74.3	70.8	73.7	77.0	82.1
23	PERCENTAGE CHANGE		4.95	0.61	1.36	3.43	4.47	2.62	-4.71	4.10	4.48	6.62
24												
25	GOVERNMENT	TEGOV	214.1	225.9	231.9	240.6	246.2	256.4	271.3	283.1	289.7	302.3
26	PERCENTAGE CHANGE		2.83	5.51	2.66	3.75	2.33	4.14	5.81	4.35	2.33	4.35
27												
28	FEDERAL, CIVILIAN	TEFG	45.0	46.7	47.0	51.7	52.0	55.8	58.5	60.9	62.9	67.0
29	PERCENTAGE CHANGE		-2.81	3.78	0.64	10.00	0.58	7.31	4.84	4.10	3.28	6.52
30												
31	STATE & LOCAL	TESLG	169.1	179.2	184.9	188.9	194.2	200.6	212.8	222.2	226.8	235.3
32	PERCENTAGE CHANGE		4.45	5.97	3.18	2.16	2.81	3.30	6.08	4.42	2.07	3.75
33												
34	AGRICULTURAL JOBS	TEFARM	149.0	153.0	151.0	153.0	147.0	134.0	138.0	143.0	131.0	116.0
35	PERCENTAGE CHANGE		-7.45	2.68	-1.31	1.32	-3.92	-8.84	2.99	3.62	-8.39	-11.45
36												
37	TOTAL EMPLOYMENT (THOUS. PERSONS)	INTOT	1514.7	1573.0	1586.0	1662.0	1683.0	1729.0	1658.0	1723.0	1783.0	1815.0
38	PERCENTAGE CHANGE		2.19	3.85	0.83	4.79	1.26	2.73	-4.11	3.92	3.48	1.79
39												
40	UNEMPLOYMENT (THOUS. PERSONS)	TNUN	65.6	70.0	78.0	64.0	68.0	92.0	151.0	110.0	120.0	111.0
41	PERCENTAGE CHANGE		-2.09	6.71	11.43	-17.95	6.25	35.29	64.13	-27.15	9.09	-7.50
42												
43	UNEMPLOYMENT RATE (PERCENT)	TNUNR	4.1	4.3	4.7	3.7	3.9	5.1	8.3	6.0	6.3	5.8
44												
45	CIVILIAN LABOR FORCE (THOUS. PERSONS)	TTCLF	1580.3	1643.0	1664.0	1726.0	1752.0	1821.0	1809.0	1833.0	1903.0	1926.0
46	PERCENTAGE CHANGE		2.01	3.97	1.28	3.73	1.51	3.94	-0.66	1.33	3.82	1.21

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-7: TENNESSEE MANUFACTURING EMPLOYMENT
(Thousands of Jobs)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL MANUFACTURING	TEMFG	470.0	464.6	460.5	489.2	519.4	513.3	459.0	486.1	506.5	522.3
2	PERCENTAGE CHANGE		3.23	-1.15	-0.88	6.23	6.17	-1.17	-10.58	5.90	4.20	3.12
3												
4	DURABLE GOODS	TEDUR	197.5	191.7	189.0	212.4	231.4	229.1	194.6	208.3	223.6	236.9
5	PERCENTAGE CHANGE		3.84	-2.94	-1.41	12.38	8.95	-0.99	-15.06	7.04	7.35	5.95
6												
7	FURNITURES AND FIXTURES	TEFUR	25.3	24.6	24.6	27.9	28.3	25.7	22.5	24.3	24.9	26.0
8	PERCENTAGE CHANGE		-0.78	-2.77	0.0	13.41	1.43	-9.19	-12.45	8.00	2.47	4.42
9												
10	FABRICATED METAL PRODUCTS	TEFAB	27.8	28.2	27.8	31.2	34.0	33.7	31.3	30.4	32.2	34.5
11	PERCENTAGE CHANGE		4.51	1.44	-1.42	12.23	8.97	-0.88	-7.12	-2.88	5.92	7.14
12												
13	NONELECTRICAL MACHINERY	TENEM	18.7	20.8	20.8	27.5	32.8	33.7	27.9	30.3	32.5	35.6
14	PERCENTAGE CHANGE		14.72	11.23	0.0	32.21	19.27	2.74	-17.21	8.60	7.26	9.54
15												
16	ELECTRICAL MACHINERY	TEELM	33.5	32.7	33.1	38.5	41.9	39.8	31.4	34.9	39.3	42.3
17	PERCENTAGE CHANGE		4.04	-2.39	1.22	16.31	8.83	-5.01	-21.11	11.15	12.61	7.63
18												
19	TRANSPORTATION EQUIPMENT	TETRE	16.7	17.0	16.8	19.6	22.2	22.5	17.6	20.0	21.6	24.6
20	PERCENTAGE CHANGE		4.37	1.80	-1.18	16.67	13.27	1.35	-21.78	13.64	8.00	13.89
21												
22	OTHER DURABLE GOODS	TEODR	75.5	68.4	65.9	67.7	72.2	73.7	63.9	68.4	73.1	73.9
23	PERCENTAGE CHANGE		2.58	-9.40	-3.66	2.73	6.65	2.08	-13.30	7.04	6.87	1.09
24												
25	NONDURABLE GOODS	TENDR	272.5	272.9	271.5	276.8	288.0	284.2	264.4	277.8	282.9	285.4
26	PERCENTAGE CHANGE		2.79	0.15	-0.51	1.95	4.05	-1.32	-6.97	5.07	1.84	0.88
27												
28	FOOD	TEFOD	35.0	36.1	35.8	36.6	38.0	38.4	38.3	40.0	40.6	39.7
29	PERCENTAGE CHANGE		2.04	3.14	-0.83	2.23	3.83	1.05	-0.26	4.44	1.50	-2.22
30												
31	TEXTILES	TETEX	36.4	36.0	34.2	32.4	33.2	31.0	27.1	28.9	28.9	28.6
32	PERCENTAGE CHANGE		9.64	-1.10	-5.00	-5.26	2.47	-6.63	-12.58	6.64	0.0	-1.04
33												
34	APPAREL	TEAPP	66.1	66.2	67.2	71.8	76.0	73.9	66.1	71.5	71.3	72.0
35	PERCENTAGE CHANGE		-4.20	0.15	1.51	6.85	5.85	-2.76	-10.55	8.17	-0.28	0.98
36												
37	PAPER	TEPAP	14.0	14.2	14.4	16.6	17.5	17.4	15.2	15.7	16.4	17.0
38	PERCENTAGE CHANGE		5.26	1.43	1.41	15.28	5.42	-0.57	-12.64	3.29	4.46	3.66
39												
40	CHEMICALS	TECHM	64.0	60.6	58.4	55.6	57.2	58.4	55.2	56.4	57.4	57.3
41	PERCENTAGE CHANGE		4.75	-5.31	-3.63	-4.79	2.88	2.10	-5.48	2.17	1.77	-0.17
42												
43	RUBBER AND PLASTICS	TERUB	12.4	14.3	14.4	15.5	17.7	18.4	16.7	16.9	19.9	22.3
44	PERCENTAGE CHANGE		21.57	15.32	0.70	7.64	14.19	3.95	-9.24	1.20	17.75	12.06
45												
46	OTHER NONDURABLE GOODS	TEOND	44.6	45.5	47.1	48.3	48.4	46.7	45.8	48.4	48.4	48.5
47	PERCENTAGE CHANGE		1.36	2.02	3.52	2.55	0.21	-3.51	-1.93	5.68	0.0	0.21

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-8: TENNESSEE AVERAGE ANNUAL WAGE AND SALARY BY SECTOR
(Dollars)

#	DESCRIPTION	MODEL LABEL	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
			HISTORICAL DATA									
1	ALL SECTORS		5798.	6093.	6496.	6871.	7331.	7970.	8601.	9191.	9993.	10902.
2	PERCENTAGE CHANGE		7.11	5.08	6.61	5.79	6.69	8.71	7.91	6.87	8.72	9.10
3												
4	MANUFACTURING	TWMFG	6070.	6398.	6778.	7180.	7617.	8387.	9154.	9881.	10697.	11635.
5	PERCENTAGE CHANGE		6.29	5.40	5.94	5.93	6.09	10.11	9.15	7.94	8.26	8.77
6												
7	DURABLE GOODS	TWDUR	6102.	6583.	6955.	7163.	7659.	8524.	9297.	9990.	10818.	11747.
8	PERCENTAGE CHANGE		5.64	7.88	5.65	2.99	6.92	11.29	9.07	7.45	8.29	8.59
9												
10	NONDURABLE GOODS	TWNDR	6048.	6269.	6655.	7192.	7582.	8277.	9085.	9798.	10601.	11542.
11	PERCENTAGE CHANGE		6.76	3.65	6.16	8.07	5.42	9.17	9.76	7.85	8.20	8.88
12												
13	CONSTRUCTION	TWCON	6673.	7012.	7626.	7408.	7715.	8531.	9696.	10110.	10954.	11505.
14	PERCENTAGE CHANGE		7.47	5.08	8.76	-2.86	4.14	10.58	13.66	4.27	8.35	5.03
15												
16	MINING	TWMIN	6344.	6828.	7621.	8256.	8969.	9662.	11331.	11272.	13543.	14539.
17	PERCENTAGE CHANGE		6.41	7.63	11.61	8.33	8.64	7.73	17.27	-0.52	20.15	7.35
18												
19	TRADE	TWTRD	5110.	5357.	5662.	5925.	6287.	6780.	7259.	7754.	8346.	8981.
20	PERCENTAGE CHANGE		6.84	4.83	5.69	4.64	6.11	7.84	7.06	6.82	7.63	7.61
21												
22	SERVICES	TWSER	5353.	5646.	5848.	6041.	6404.	7002.	7602.	8127.	8690.	9696.
23	PERCENTAGE CHANGE		7.47	5.47	3.58	3.30	6.01	9.34	8.57	6.91	6.93	11.58
24												
25	FINANCE, INSURANCE & REAL ESTATE	TWFIR	6060.	6422.	6958.	7564.	8020.	8543.	9060.	9819.	10698.	11652.
26	PERCENTAGE CHANGE		5.23	5.97	8.35	8.71	6.03	6.52	6.05	8.38	8.95	8.92
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TWTCU	7427.	7972.	8725.	9560.	10459.	11263.	12063.	13260.	14493.	15796.
29	PERCENTAGE CHANGE		5.42	7.34	9.45	9.57	9.40	7.69	7.10	9.92	9.30	8.99
30												
31	GOVERNMENT	TWGOV	6008.	6291.	6863.	7508.	8118.	8615.	9100.	9574.	10684.	11746.
32	PERCENTAGE CHANGE		7.82	4.70	9.10	9.39	8.13	6.11	5.63	5.21	11.59	9.95
33												
34	FEDERAL, CIVILIAN	TWFG	8655.	9513.	10634.	10981.	11858.	12331.	13281.	14517.	16272.	18498.
35	PERCENTAGE CHANGE		13.90	9.91	11.78	3.26	7.99	3.99	7.70	9.31	12.09	13.68
36												
37	STATE & LOCAL	TWSLG	5304.	5451.	5905.	6557.	7117.	7581.	7950.	8219.	9134.	9824.
38	PERCENTAGE CHANGE		6.23	2.77	8.33	11.04	8.54	6.52	4.87	3.38	11.13	7.55
39												
40	AGRICULTURE	TWFAR	1843.	1950.	1996.	2172.	2460.	2953.	3094.	3267.	3483.	3765.
41	PERCENTAGE CHANGE		11.63	5.81	2.36	8.82	13.26	20.04	4.77	5.59	6.61	6.10

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-9: TENNESSEE MANUFACTURING AVERAGE ANNUAL WAGE AND SALARY (Dollars)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL MANUFACTURING	TWMFG	6070.	6398.	6778.	7180.	7617.	8387.	9154.	9881.	10697.	11635.
2	PERCENTAGE CHANGE		6.29	5.40	5.94	5.93	6.09	10.11	9.15	7.94	8.26	8.77
3												
4	DURABLE GOODS	TWDUR	6102.	6583.	6955.	7163.	7659.	8524.	9297.	9990.	10818.	11747.
5	PERCENTAGE CHANGE		5.64	7.88	5.65	2.99	6.92	11.29	9.07	7.45	8.29	8.59
6												
7	FURNITURES AND FIXTURES	TWFUR	4680.	5312.	5640.	5736.	6205.	6851.	7085.	7767.	8319.	8776.
8	PERCENTAGE CHANGE		-4.14	13.50	6.17	1.70	8.18	10.41	3.42	9.63	7.11	5.49
9												
10	FABRICATED METALS	TWFAB	6566.	6967.	7661.	7518.	7440.	8134.	10504.	10844.	11484.	12084.
11	PERCENTAGE CHANGE		10.80	6.11	9.96	-1.87	-1.04	9.33	29.14	3.24	5.90	5.22
12												
13	NONELECTRICAL MACHINERY	TWNEM	7725.	7401.	7760.	7001.	7998.	9652.	10693.	11150.	12401.	13107.
14	PERCENTAGE CHANGE		7.37	-4.19	4.85	-9.78	14.24	20.68	10.79	4.27	11.22	5.69
15												
16	ELECTRICAL MACHINERY	TWELM	5569.	5942.	6386.	6648.	7310.	7891.	8522.	9361.	9883.	10562.
17	PERCENTAGE CHANGE		1.13	6.70	7.47	4.10	9.96	7.95	8.00	9.85	5.58	6.87
18												
19	TRANSPORTATION EQUIPMENT	TWTRE	6545.	7162.	6984.	8072.	8351.	9037.	9490.	10420.	11433.	13068.
20	PERCENTAGE CHANGE		3.22	9.43	-2.49	15.58	3.46	8.21	5.01	9.80	9.72	14.30
21												
22	OTHER DURABLE GOODS	TWODR	6144.	6794.	7172.	7684.	8169.	8955.	9051.	10083.	10992.	12218.
23	PERCENTAGE CHANGE		7.56	10.58	5.56	7.14	6.31	9.62	1.07	11.40	9.02	11.15
24												
25	NONDURABLE GOODS	TWNDR	6048.	6269.	6655.	7192.	7582.	8277.	9085.	9798.	10601.	11542.
26	PERCENTAGE CHANGE		6.76	3.65	6.16	8.07	5.42	9.17	9.76	7.85	8.20	8.88
27												
28	FOOD	TWFOD	6404.	6764.	7209.	7691.	8160.	9248.	10078.	10864.	11524.	12564.
29	PERCENTAGE CHANGE		5.33	5.62	6.58	6.69	6.10	13.33	8.97	7.80	6.08	9.02
30												
31	TEXTILES	TWTEX	4955.	5140.	5469.	6286.	6617.	7141.	7181.	7819.	8172.	9233.
32	PERCENTAGE CHANGE		2.08	3.73	6.40	14.94	5.27	7.92	0.56	8.88	4.51	12.98
33												
34	APPAREL	TWAPP	3884.	4014.	4208.	4519.	4766.	5121.	5511.	6150.	6506.	6900.
35	PERCENTAGE CHANGE		5.74	3.35	4.83	7.39	5.47	7.45	7.62	11.59	5.79	6.06
36												
37	PAPER	TWPAP	7370.	7728.	8175.	7843.	8298.	9010.	10947.	12281.	13548.	14960.
38	PERCENTAGE CHANGE		5.95	4.86	5.78	-4.06	5.80	8.58	21.50	12.19	10.32	10.42
39												
40	CHEMICALS	TWCHM	8533.	9010.	9660.	10737.	11305.	12237.	13615.	14864.	15813.	17246.
41	PERCENTAGE CHANGE		7.94	5.59	7.21	11.15	5.29	8.24	11.26	9.17	6.38	9.06
42												
43	RUBBER AND PLASTICS	TWRUB	7351.	7191.	7994.	9068.	9593.	10030.	11397.	11739.	14104.	14590.
44	PERCENTAGE CHANGE		-4.53	-2.18	11.17	13.43	5.79	4.56	13.63	3.00	20.15	3.45
45												
46	OTHER NONDURABLE GOODS	TWOND	5523.	5655.	5988.	6492.	6819.	7312.	7618.	8103.	8691.	9621.
47	PERCENTAGE CHANGE		8.23	2.39	5.89	8.42	5.04	7.23	4.18	6.37	7.26	10.70

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-10: TENNESSEE AVERAGE ANNUAL WAGE AND SALARY BY SECTOR
(1972 Dollars)

#	DESCRIPTION	MODEL LABEL	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
			HISTORICAL DATA									
1	ALL SECTORS		6552.	6587.	6724.	6871.	6949.	6818.	6804.	6921.	7117.	7268.
2	PERCENTAGE CHANGE		2.39	0.53	2.09	2.19	1.13	-1.89	-0.20	1.72	2.84	2.12
3												
4	MANUFACTURING	TWMFG*	6859.	6917.	7017.	7180.	7220.	7175.	7242.	7441.	7619.	7757.
5	PERCENTAGE CHANGE		1.60	0.85	1.44	2.33	0.56	-0.63	0.94	2.74	2.40	1.81
6												
7	DURABLE GOODS	TWDUR*	6895.	7117.	7200.	7163.	7260.	7292.	7355.	7523.	7705.	7831.
8	PERCENTAGE CHANGE		0.99	3.22	1.17	-0.51	1.35	0.44	0.87	2.28	2.43	1.64
9												
10	NONDURABLE GOODS	TWNDR*	6834.	6777.	6889.	7192.	7187.	7080.	7188.	7378.	7551.	7695.
11	PERCENTAGE CHANGE		2.06	-0.83	1.65	4.39	-0.07	-1.48	1.51	2.65	2.34	1.91
12												
13	CONSTRUCTION	TWCCN*	7540.	7581.	7894.	7408.	7313.	7298.	7671.	7613.	7802.	7670.
14	PERCENTAGE CHANGE		2.74	0.54	4.14	-6.16	-1.29	-0.21	5.11	-0.76	2.48	-1.69
15												
16	MINING	TWMIN*	7168.	7382.	7889.	8256.	8501.	8265.	8964.	8488.	9646.	9693.
17	PERCENTAGE CHANGE		1.72	2.97	6.88	4.65	2.97	-2.78	8.46	-5.31	13.64	0.48
18												
19	TRADE	TWTRD*	5774.	5791.	5861.	5925.	5959.	5800.	5743.	5839.	5944.	5987.
20	PERCENTAGE CHANGE		2.13	0.30	1.21	1.09	0.58	-2.68	-0.98	1.67	1.81	0.72
21												
22	SERVICES	TWSER*	6049.	6104.	6054.	6041.	6070.	5990.	6014.	6120.	6189.	6464.
23	PERCENTAGE CHANGE		2.73	0.91	-0.82	-0.21	0.48	-1.32	0.41	1.75	1.14	4.44
24												
25	FINANCE, INSURANCE & REAL ESTATE	TWFIR*	6847.	6943.	7203.	7564.	7602.	7308.	7168.	7394.	7620.	7768.
26	PERCENTAGE CHANGE		0.59	1.39	3.75	5.01	0.50	-3.87	-1.92	3.15	3.05	1.95
27												
28	TRANS., COMM. & PUBLIC UTILITIES	TWTCU*	8392.	8618.	9032.	9560.	9914.	9635.	9544.	9985.	10323.	10531.
29	PERCENTAGE CHANGE		0.78	2.70	4.80	5.84	3.70	-2.81	-0.95	4.63	3.38	2.02
30												
31	GOVERNMENT	TWGOV*	6789.	6801.	7105.	7508.	7695.	7369.	7199.	7209.	7610.	7831.
32	PERCENTAGE CHANGE		3.07	0.17	4.47	5.67	2.50	-4.23	-2.31	0.14	5.55	2.91
33												
34	FEDERAL, CIVILIAN	TWFG*	9780.	10284.	11008.	10981.	11240.	10548.	10507.	10931.	11590.	12332.
35	PERCENTAGE CHANGE		8.88	5.16	7.04	-0.25	2.36	-6.15	-0.39	4.04	6.02	6.40
36												
37	STATE & LOCAL	TWSLG*	5993.	5893.	6113.	6557.	6746.	6485.	6290.	6189.	6506.	6549.
38	PERCENTAGE CHANGE		1.55	-1.67	3.73	7.27	2.88	-3.87	-3.01	-1.60	5.12	0.67
39												
40	AGRICULTURE	TWFAR*	2082.	2108.	2066.	2172.	2332.	25[illegible].	2448.	2460.	2481.	2510.
41	PERCENTAGE CHANGE		6.71	1.23	-1.99	5.12	7.36	8.[illegible]	-3.10	0.50	0.84	1.18

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-11: TENNESSEE MANUFACTURING AVERAGE ANNUAL WAGE AND SALARY
(1972 Dollars)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA									
			1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL MANUFACTURING	TWMFG*	6859.	6917.	7017.	7180.	7220.	7175.	7242.	7441.	7619.	7757.
2	PERCENTAGE CHANGE		1.60	0.85	1.44	2.33	0.56	-0.63	0.94	2.74	2.40	1.81
3												
4	DURABLE GOODS	TWDUR*	6895.	7117.	7200.	7163.	7260.	7292.	7355.	7523.	7705.	7831.
5	PERCENTAGE CHANGE		0.99	3.22	1.17	-0.51	1.35	0.44	0.87	2.28	2.43	1.64
6												
7	FURNITURE AND FIXTURES	TWFUR*	5288.	5743.	5839.	5736.	5882.	5861.	5605.	5849.	5925.	5851.
8	PERCENTAGE CHANGE		-8.36	8.60	1.67	-1.76	2.54	-0.36	-4.36	4.34	1.31	-1.26
9												
10	FABRICATED METAL PRODUCTS	TWFAB*	7419.	7532.	7931.	7518.	7052.	6958.	8310.	8166.	8179.	8056.
11	PERCENTAGE CHANGE		5.92	1.52	5.29	-5.20	-6.20	-1.33	19.43	-1.74	0.17	-1.51
12												
13	NONELECTRICAL MACHINERY	TWNEM*	8729.	8001.	8033.	7001.	7581.	8257.	8460.	8396.	8833.	8738.
14	PERCENTAGE CHANGE		2.63	-8.34	0.40	-12.85	8.29	8.91	2.46	-0.75	5.20	-1.07
15												
16	ELECTRICAL MACHINERY	TWELM*	6293.	6424.	6611.	6648.	6929.	6750.	6742.	7049.	7039.	7041.
17	PERCENTAGE CHANGE		-3.33	2.08	2.91	0.56	4.23	-2.58	-0.12	4.55	-0.14	0.03
18												
19	TRANSPORTATION EQUIPMENT	TWTRE*	7395.	7743.	7230.	8072.	7916.	7731.	7508.	7846.	8143.	8712.
20	PERCENTAGE CHANGE		-1.33	4.70	-6.62	11.65	-1.94	-2.34	-2.88	4.51	3.78	6.99
21												
22	OTHER DURABLE GOODS	TWODR*	6942.	7345.	7424.	7684.	7743.	7660.	7161.	7593.	7829.	8145.
23	PERCENTAGE CHANGE		2.82	5.80	1.08	3.50	0.77	-1.07	-6.52	6.03	3.11	4.04
24												
25	NONDURABLE GOODS	TWNDR*	6834.	6777.	6889.	7192.	7187.	7080.	7188.	7378.	7551.	7695.
26	PERCENTAGE CHANGE		2.06	-0.83	1.65	4.39	-0.07	-1.48	1.51	2.65	2.34	1.91
27												
28	FOOD	TWFOD*	7236.	7312.	7463.	7691.	7735.	7911.	7973.	8181.	8208.	8376.
29	PERCENTAGE CHANGE		0.69	1.05	2.06	3.06	0.57	2.28	0.78	2.60	0.33	2.05
30												
31	TEXTILES	TWTEX*	5599.	5557.	5661.	6286.	6272.	6109.	5681.	5888.	5821.	6155.
32	PERCENTAGE CHANGE		-2.42	-0.75	1.88	11.03	-0.22	-2.61	-7.00	3.64	-1.14	5.75
33												
34	APPAREL	TWAPP*	4389.	4339.	4356.	4519.	4518.	4381.	4360.	4631.	4634.	4600.
35	PERCENTAGE CHANGE		1.08	-1.12	0.38	3.74	-0.03	-3.03	-0.47	6.22	0.06	-0.73
36												
37	PAPER	TWPAP*	8328.	8355.	8463.	7843.	7865.	7707.	8661.	9248.	9650.	9973.
38	PERCENTAGE CHANGE		1.28	0.32	1.29	-7.32	0.29	-2.01	12.37	6.78	4.35	3.36
39												
40	CHEMICALS	TWCHM*	9642.	9741.	10000.	10737.	10716.	10468.	10771.	11193.	11263.	11497.
41	PERCENTAGE CHANGE		3.19	1.02	2.66	7.37	-0.20	-2.31	2.90	3.91	0.63	2.08
42												
43	RUBBER AND PLASTICS	TWRUB*	8306.	7774.	8275.	9068.	9093.	8580.	9017.	8840.	10046.	9727.
44	PERCENTAGE CHANGE		-8.74	-6.41	6.45	9.58	0.27	-5.64	5.09	-1.96	13.64	-3.17
45												
46	OTHER NONDURABLE GOODS	TWOND*	6241.	6114.	6199.	6492.	6464.	6255.	6027.	6102.	6190.	6414.
47	PERCENTAGE CHANGE		3.46	-2.04	1.39	4.73	-0.44	-3.23	-3.65	1.24	1.45	3.62

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-12: TENNESSEE PERSONAL INCOME BY COMPONENTS

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA									
			1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL PERSONAL INCOME (MIL $)	TPYC01	11210.3	12120.5	13282.6	14968.1	16908.0	18736.7	20124.5	22626.1	25211.7	28527.5
2	PERCENTAGE CHANGE		8.69	8.12	9.59	12.69	12.96	10.82	7.41	12.43	11.43	13.15
3												
4	WAGES AND SALARIES	TPYC02	7899.6	8408.8	9139.3	10316.3	11571.6	12797.7	13312.6	14872.5	16700.8	19067.8
5	PERCENTAGE CHANGE		10.40	6.45	8.69	12.88	12.17	10.60	4.02	11.72	12.29	14.17
6												
7	OTHER LABOR INCOME	TPYC47	462.8	529.3	606.2	724.7	841.9	972.7	1114.9	1334.2	1576.0	1839.8
8	PERCENTAGE CHANGE		14.45	14.35	14.54	19.55	16.17	15.53	14.62	19.67	18.12	16.74
9												
10	PROPRIETORS' INCOME	TPYC52	1140.9	1126.2	1210.7	1381.3	1633.6	1551.6	1507.2	1751.1	1788.1	2024.6
11	PERCENTAGE CHANGE		3.94	-1.28	7.50	14.09	18.26	-5.02	-2.86	16.19	2.11	13.22
12												
13	PROPERTY INCOME	TPYC65	1188.1	1340.2	1482.9	1656.7	1831.6	2105.2	2205.7	2518.2	2911.5	3292.9
14	PERCENTAGE CHANGE		5.46	12.80	10.65	11.72	10.56	14.94	4.77	14.17	15.62	13.10
15												
16	TRANSFER PAYMENTS	TPY073	1064.8	1309.4	1519.1	1672.5	1949.4	2372.8	3091.6	3364.7	3606.5	3895.8
17	PERCENTAGE CHANGE		11.03	22.98	16.02	10.10	16.55	21.72	30.29	8.83	7.19	8.02
18												
19	LESS: PERS. CONT. FOR SOCIAL INS.	TPY103	417.1	449.2	518.8	595.3	729.5	851.2	885.5	997.8	1109.5	1267.7
20	PERCENTAGE CHANGE		17.59	7.69	15.50	14.75	22.54	16.69	4.02	12.68	11.20	14.26
21												
22	RESIDENCE ADJUSTMENT	TPY104	-128.8	-144.2	-156.9	-188.1	-190.6	-212.1	-222.0	-216.9	-261.6	-325.8
23	PERCENTAGE CHANGE		72.52	11.95	8.87	19.89	1.31	11.26	4.67	-2.31	20.64	24.53
24												
25	PER CAPITA PERSONAL INCOME ($)	TPYPC	2813.	3083.	3329.	3713.	4129.	4516.	4823.	5344.	5874.	6548.
26	PERCENTAGE CHANGE		7.78	9.60	7.98	11.53	11.20	9.37	6.80	10.80	9.92	11.47
27												
28	TOTAL PERSONAL INCOME (MIL 72 $)	TPY001*	12667.0	13103.2	13750.1	14968.1	16026.5	16028.0	15921.3	17037.7	17957.1	19018.3
29	PERCENTAGE CHANGE		3.90	3.44	4.94	8.86	7.07	0.01	-0.67	7.01	5.40	5.91
30												
31	PER CAPITA PERSONAL INCOME (72 $)	TPYPC*	3179.	3332.	3446.	3713.	3914.	3863.	3815.	4024.	4184.	4365.
32	PERCENTAGE CHANGE		3.04	4.84	3.41	7.75	5.40	-1.29	-1.24	5.47	3.97	4.33
33												
34	TN INDIVIDUAL IRS COLLECTIONS (MIL $)	TTRVIRS	1264.5	1231.9	1334.2	1418.3	1725.3	1968.4	1973.3	2281.4	2632.7	3025.5
35	PERCENTAGE CHANGE		27.27	-2.58	8.31	6.30	21.64	14.09	0.25	15.61	15.40	14.92
36												
37	DISPOSABLE PERSONAL INCOME (MIL $)	TDPY	9945.8	10888.6	11948.4	13549.8	15182.7	16768.3	18151.2	20344.7	22579.0	25502.0
38	PERCENTAGE CHANGE		6.71	9.48	9.73	13.40	12.05	10.44	8.25	12.08	10.98	12.95
39												
40	PER CAPITA DISPOSABLE INCOME ($)	TDPYPC	2496.	2769.	2995.	3361.	3708.	4042.	4349.	4805.	5261.	5853.
41	PERCENTAGE CHANGE		5.85	10.94	8.16	12.22	10.32	9.01	7.60	10.49	9.49	11.25
42												
43	DISPOSABLE INCOME (MIL 72 $)	TDPY*	11238.1	11771.5	12368.9	13549.8	14391.2	14344.1	14360.1	15319.8	16081.9	17001.3
44	PERCENTAGE CHANGE		2.01	4.75	5.07	9.55	6.21	-0.33	0.11	6.68	4.97	5.72
45												
46	PER CAPITA DISPOSABLE INCOME (72 $)	TDPYPC*	2820.	2994.	3100.	3361.	3515.	3458.	3441.	3618.	3747.	3902.
47	PERCENTAGE CHANGE		1.18	6.17	3.54	8.42	4.58	-1.62	-0.49	5.14	3.57	4.14

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-13: TENNESSEE RETAIL SALES

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	TOTAL (MIL $)	TRSTOT	5953.6	6217.1	7011.6	7798.5	9639.6	10797.1	11436.1	12748.0	14255.3	15712.2
2	PERCENTAGE CHANGE		2.51	4.43	12.78	11.22	23.61	12.01	5.92	11.47	11.82	10.22
3												
4	AUTOMOTIVE	TRSAUT	1225.9	1161.2	1470.0	1723.6	2151.7	2133.1	2268.3	2707.1	3193.9	3628.7
5	PERCENTAGE CHANGE		-0.52	-5.28	26.59	17.25	24.84	-0.87	6.34	19.34	17.98	13.61
6												
7	NONAUTOMOTIVE	TRSNAUT	4727.7	5055.8	5541.6	6074.9	7487.9	8664.0	9167.8	10040.9	11061.4	12083.5
8	PERCENTAGE CHANGE		3.32	6.94	9.61	9.62	23.26	15.71	5.81	9.52	10.16	9.24
9												
10												
11	TOTAL (MIL 72 $)	TRSTOT*	6727.3	6721.2	7258.4	7798.5	9137.1	9236.2	9047.5	9599.4	10153.3	10474.8
12	PERCENTAGE CHANGE		-2.01	-0.09	7.99	7.44	17.17	1.08	-2.04	6.10	5.77	3.17
13												
14	AUTOMOTIVE	TRSAUT*	1385.2	1255.4	1521.7	1723.6	2039.6	1824.7	1794.5	2038.5	2274.9	2419.1
15	PERCENTAGE CHANGE		-4.91	-9.37	21.21	13.27	18.33	-10.53	-1.65	13.59	11.60	6.34
16												
17	NONAUTOMOTIVE	TRSNAUT*	5342.0	5465.8	5736.6	6074.9	7097.6	7411.5	7253.0	7560.9	7878.5	8055.7
18	PERCENTAGE CHANGE		-1.23	2.32	4.96	5.90	16.83	4.42	-2.14	4.25	4.20	2.25

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-14: TENNESSEE ENERGY CONSUMPTION -- SELECTED CATEGORIES

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	ELECTRICITY (MIL. KWH)		34162.	36273.	37595.	40406.	43192.	42398.	42686.	45463.	50123.	50854.
2	PERCENTAGE CHANGE		9.72	6.18	3.65	7.47	6.90	-1.84	0.68	6.50	10.25	1.46
3												
4	RESIDENTIAL	TECRES	17784.	18872.	19048.	20016.	21545.	21258.	22038.	22876.	25466.	25839.
5	PERCENTAGE CHANGE		10.19	6.12	0.93	5.09	7.64	-1.34	3.67	3.80	11.32	1.46
6												
7	COMMERCIAL	TECC	3147.	3152.	3223.	3411.	3588.	3464.	3516.	3647.	4210.	4247.
8	PERCENTAGE CHANGE		3.79	0.15	2.28	5.83	5.18	-3.45	1.49	3.72	15.44	0.87
9												
10	INDUSTRIAL	TECI	13231.	14249.	15324.	16978.	18058.	17676.	17133.	18941.	20447.	20768.
11	PERCENTAGE CHANGE		10.58	7.70	7.55	10.79	6.36	-2.12	-3.07	10.55	7.95	1.57
12												
13	TOTAL GAS (MIL. THERMS)		2366.	2463.	2443.	2446.	2461.	2382.	2004.	1988.	1858.	1903.
14	PERCENTAGE CHANGE		18.10	4.10	-0.80	0.12	0.61	-3.21	-15.87	-0.80	-6.54	2.42
15												
16	RESIDENTIAL	TTGSRES	453.	473.	462.	455.	468.	449.	451.	470.	474.	487.
17	PERCENTAGE CHANGE		4.77	4.37	-2.22	-1.52	2.86	-4.06	0.45	4.21	0.85	2.74
18												
19	COMMERCIAL	TTGSCOM	353.	368.	377.	383.	389.	362.	364.	360.	369.	379.
20	PERCENTAGE CHANGE		6.33	4.26	2.59	1.59	1.57	-6.94	0.55	-1.10	2.50	2.71
21												
22	INDUSTRIAL	TTGSIND	1561.	1623.	1604.	1608.	1604.	1571.	1189.	1158.	1015.	1037.
23	PERCENTAGE CHANGE		25.90	3.99	-1.16	0.25	-0.25	-2.06	-24.32	-2.61	-12.35	2.17
24												
25	COAL (THOUS. TONS)	TCOCN	15077.	15149.	14666.	14349.	17440.	19894.	18848.	22361.	21696.	20618.
26	PERCENTAGE CHANGE		17.47	0.48	-3.19	-2.16	21.54	14.07	-5.26	18.64	-2.97	-4.97
27												
28	GASOLINE (MIL. GAL.)	TGASO	1737.	1789.	1917.	2094.	2264.	2212.	2288.	2409.	2501.	2588.
29	PERCENTAGE CHANGE		6.34	2.98	7.19	9.23	8.12	-2.32	3.42	5.32	3.78	3.51
30												
31	FUEL OIL (THOUS. BARRELS)	TFOIL	11218.	11541.	11974.	14741.	15960.	16698.	18391.	22523.	24190.	24553.
32	PERCENTAGE CHANGE		5.71	2.88	3.75	23.11	8.27	4.62	10.14	22.47	7.40	1.50

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-15: TENNESSEE ENERGY CONSUMPTION

(Trillions of BTU's)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA									
			1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	ELECTRICITY	TFEAELECCCN	177.5	185.2	184.3	198.8	221.5	221.5	221.7	224.4	261.7	265.6
2	PERCENTAGE CHANGE		5.53	4.34	-0.49	7.87	11.42	0.0	0.09	1.22	16.62	1.49
3												
4	RESIDENTIAL	TFEAELCRES	61.9	65.7	66.5	70.2	75.0	74.0	76.7	78.8	88.6	89.9
5	PERCENTAGE CHANGE		10.14	6.14	1.22	5.56	6.84	-1.33	3.65	2.74	12.44	1.47
6												
7	COMMERCIAL	TFEAELCCOM	12.6	12.8	13.3	14.2	14.9	14.6	14.8	14.8	17.7	17.9
8	PERCENTAGE CHANGE		4.13	1.59	3.91	6.77	4.93	-2.01	1.37	0.0	19.59	1.13
9												
10	INDUSTRIAL	TFEAELCIND	103.0	106.8	104.6	114.4	131.6	132.9	130.2	130.8	155.4	157.8
11	PERCENTAGE CHANGE		3.10	3.69	-2.06	9.37	15.03	0.99	-2.03	0.46	18.81	1.54
12												
13	NATURAL GAS	TFEANGASCCN	272.0	271.8	282.6	292.4	309.0	271.3	231.5	229.1	223.2	231.4
14	PERCENTAGE CHANGE		8.93	-0.07	3.97	3.47	5.68	-12.20	-14.67	-1.04	-2.58	3.67
15												
16	RESIDENTIAL	TFEANGCRES	46.8	48.1	48.5	55.5	47.5	45.0	45.4	47.3	47.7	49.0
17	PERCENTAGE CHANGE		3.54	2.78	0.83	14.43	-14.41	-5.26	0.89	4.19	0.85	2.73
18												
19	COMMERCIAL	TFEANGCCOM	42.4	44.1	45.5	47.2	47.4	46.1	43.8	43.5	44.4	45.6
20	PERCENTAGE CHANGE		7.07	4.01	3.17	3.74	0.42	-2.74	-4.99	-0.68	2.07	2.70
21												
22	INDUSTRIAL	TFEANGCIND	138.2	134.5	142.5	146.9	172.4	155.5	122.5	116.4	104.6	106.9
23	PERCENTAGE CHANGE		15.55	-2.68	5.95	3.09	17.36	-9.80	-21.22	-4.98	-10.14	2.20
24												
25	OTHER	TFEANGCOTH	44.6	45.1	46.1	42.8	41.7	24.7	19.8	21.9	26.5	29.9
26	PERCENTAGE CHANGE		-1.55	1.12	2.22	-7.16	-2.57	-40.77	-19.84	10.61	21.00	12.83
27												
28	COAL	TFEACOALCCN	398.5	431.4	433.1	485.7	501.8	421.2	591.2	611.3	651.2	631.8
29	PERCENTAGE CHANGE		-2.16	8.25	0.39	12.14	3.31	-16.06	40.36	3.40	6.53	-2.98
30												
31	FUEL OIL	TFEAFOILCCN	88.4	90.9	93.2	105.0	113.4	113.5	121.6	160.1	159.9	162.3
32	PERCENTAGE CHANGE		2.43	2.83	2.53	12.66	8.00	0.09	7.14	31.66	-0.12	1.50
33												
34	GASOLINE	TFEAGASOCCN	219.4	227.5	243.4	266.1	286.9	272.6	286.7	306.3	313.4	324.4
35	PERCENTAGE CHANGE		6.66	3.69	6.99	9.33	7.82	-4.98	5.17	6.84	2.32	3.51
36												
37	OTHER	TFEAOTHRCCN	133.8	140.2	151.6	171.9	184.4	177.5	182.2	187.1	190.8	194.6
38	PERCENTAGE CHANGE		1.13	4.78	8.13	13.39	7.27	-3.74	2.65	2.69	1.98	1.99
39												
40												
41	TOTAL ENERGY CONSUMPTION	TFEATOTLCON	1289.6	1347.0	1388.2	1519.9	1617.0	1477.6	1634.9	1718.3	1800.2	1810.1
42	PERCENTAGE CHANGE		3.21	4.45	3.06	9.49	6.39	-8.62	10.65	5.10	4.77	0.55
43												
44	GROSS ENERGY CONSUMPTION		1112.1	1161.8	1203.9	1321.1	1395.5	1256.1	1413.2	1493.9	1538.5	1544.5
45	PERCENTAGE CHANGE		2.85	4.47	3.62	9.74	5.63	-9.99	12.51	5.71	2.99	0.39
46												
47	NET ENERGY CONSUMPTION		880.1	894.3	902.6	968.6	1057.2	1002.2	962.2	920.2	1025.9	1066.8
48	PERCENTAGE CHANGE		5.00	1.61	0.93	7.31	9.15	-5.20	-3.99	-4.37	11.49	3.99

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-16: TENNESSEE ENERGY PRICES

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	ELECTRICITY (CENTS/KILOWATT-HOUR)		0.92	1.01	1.17	1.16	1.23	1.46	1.99	2.19	2.29	2.75
2	PERCENTAGE CHANGE		7.17	10.03	15.76	-0.72	6.10	18.23	36.38	10.21	4.36	20.19
3												
4	RESIDENTIAL	TEPRES	0.99	1.08	1.26	1.26	1.33	1.56	2.07	2.30	2.35	2.74
5	PERCENTAGE CHANGE		7.61	9.09	16.67	0.0	5.56	17.29	32.69	11.11	2.17	16.60
6												
7	COMMERCIAL	TEPC	1.36	1.47	1.65	1.65	1.73	1.95	2.50	2.72	2.87	3.44
8	PERCENTAGE CHANGE		7.09	8.09	12.24	0.0	4.85	12.72	28.21	8.80	5.51	19.86
9												
10	INDUSTRIAL	TEPI	0.72	0.82	0.96	0.95	1.02	1.24	1.78	1.96	2.09	2.62
11	PERCENTAGE CHANGE		7.46	13.89	17.07	-1.04	7.37	21.57	43.55	10.11	6.63	25.36
12												
13												
14	TOTAL GAS (CENTS/THERM)		5.0	5.2	5.8	6.4	6.7	7.8	10.0	12.3	16.0	17.7
15	PERCENTAGE CHANGE		-5.78	3.98	11.16	10.25	5.42	15.81	28.15	23.54	30.25	10.44
16												
17	RESIDENTIAL	TTGPRES	8.8	8.9	9.5	10.5	10.9	11.8	13.3	14.9	17.8	19.3
18	PERCENTAGE CHANGE		0.39	1.36	7.05	10.35	3.51	8.44	12.55	12.03	19.46	8.43
19												
20	COMMERCIAL	TTGPCOM	7.0	7.2	7.7	8.5	9.1	10.2	11.9	14.4	18.5	20.3
21	PERCENTAGE CHANGE		0.42	3.50	6.65	10.36	7.25	11.99	16.36	21.01	28.47	9.73
22												
23	INDUSTRIAL	TTGPIND	3.4	3.6	4.2	4.7	4.9	6.1	8.1	10.6	14.3	16.0
24	PERCENTAGE CHANGE		-5.75	5.98	15.97	10.49	4.83	23.41	33.86	30.86	34.91	11.89
25												
26	COAL PRICE ($/TON)	TCPR	4.64	5.07	6.68	7.48	8.29	9.50	19.08	20.52	22.80	26.56
27	PERCENTAGE CHANGE		4.74	9.27	31.76	11.98	10.83	14.60	100.84	7.55	11.11	16.49
28												
29	GASOLINE PRICE INDEX (1967=100)	UPIGAS	97.8	96.1	101.3	104.0	122.0	195.5	231.1	253.8	276.3	288.7
30	PERCENTAGE CHANGE		1.98	-1.74	5.41	2.67	17.31	60.25	18.21	9.82	8.87	4.49
31												
32	FUEL OIL PRICE INDEX (1967=100)	UPIMDIST	102.4	106.5	110.0	111.3	139.7	272.0	309.4	336.8	384.2	398.0
33	PERCENTAGE CHANGE		0.49	4.00	3.29	1.18	25.52	94.70	13.75	8.86	14.07	3.59

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-17: TENNESSEE COMMERCIAL BANKS AND SAVINGS AND LOANS ASSETS AND LIABILITIES

(Millions of Dollars)

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	COMMERCIAL BANKS											
2	ASSETS		7667.4	8653.2	10095.4	12102.7	13928.4	14665.9	15434.3	16421.6	18126.7	20269.8
3	PERCENTAGE CHANGE		6.26	12.86	16.67	19.88	15.09	5.29	5.24	6.40	10.38	11.82
4												
5	TOTAL LOANS	TTLCAN	3970.4	4362.3	5023.5	6195.7	7601.4	8087.6	8197.4	9074.0	10415.9	11932.9
6	PERCENTAGE CHANGE		5.29	9.87	15.16	23.33	22.69	6.40	1.36	10.69	14.79	14.56
7												
8	SECURITIES AND OTHER INVESTMENTS	TINVSECCAST	3696.9	4290.9	5071.9	5907.0	6327.0	6578.2	7236.8	7347.6	7710.8	8336.9
9	PERCENTAGE CHANGE		7.33	16.07	18.20	16.47	7.11	3.97	10.01	1.53	4.94	8.12
10												
11	LIABILITIES											
12	TOTAL DEPOSITS	TDEPTOT	6593.4	7442.1	8682.0	10328.6	11690.6	12287.5	13097.5	14249.0	15839.6	17534.5
13	PERCENTAGE CHANGE		6.20	12.87	16.66	18.97	13.19	5.11	6.59	8.79	11.16	10.70
14												
15	DEMAND DEPOSITS	TDEPDEM	3546.2	3730.2	4065.7	4593.7	4994.1	4849.4	4973.5	5145.7	5626.2	6226.2
16	PERCENTAGE CHANGE		2.35	5.19	8.99	12.99	8.72	-2.90	2.56	3.46	9.34	10.66
17												
18	TIME DEPOSITS	TDEPTIM	3047.2	3711.9	4616.3	5734.9	6696.4	7438.1	8124.0	9103.3	10213.4	11308.3
19	PERCENTAGE CHANGE		11.05	21.81	24.36	24.23	16.77	11.08	9.22	12.05	12.19	10.72
20												
21	AVERAGE YIELDS (PERCENT)											
22	LOANS	TNCBLOANINT	7.66	8.10	7.61	7.49	8.69	9.81	8.83	9.04	9.31	9.67
23	PERCENTAGE CHANGE		11.99	5.74	-6.05	-1.58	16.02	12.89	-9.99	2.38	2.99	3.87
24												
25	SECURITIES	TNCBSECINTR	4.41	4.79	5.02	4.95	5.25	5.67	5.98	6.31	6.26	6.29
26	PERCENTAGE CHANGE		3.76	8.62	4.80	-1.39	6.06	8.00	5.47	5.52	-0.79	0.48
27												
28												
29	SAVINGS AND LOANS											
30	ASSETS		1807.7	1995.8	2357.7	2817.1	3151.5	3456.4	4023.8	4651.2	5510.8	6392.2
31	PERCENTAGE CHANGE		6.97	10.40	18.14	19.48	11.87	9.67	16.42	15.59	18.48	15.99
32												
33	TOTAL LOANS	TSLTLOAN	1577.5	1694.8	2006.8	2432.3	2778.6	3035.7	3432.2	3975.1	4753.8	5550.8
34	PERCENTAGE CHANGE		8.33	7.44	18.40	21.20	14.24	9.25	13.06	15.82	19.59	16.77
35												
36	SECURITIES AND OTHER INVESTMENTS	TSLSCINV	230.3	300.9	350.9	384.8	372.9	420.7	591.6	676.0	757.0	841.4
37	PERCENTAGE CHANGE		-1.49	30.69	16.63	9.65	-3.09	12.82	40.62	14.27	11.98	11.14
38												
39	LIABILITIES											
40	TIME DEPOSITS	TSLSC	1567.7	1727.1	2060.7	2435.8	2692.5	2934.5	3434.9	4006.4	4684.4	5291.1
41	PERCENTAGE CHANGE		5.36	10.17	19.32	18.20	10.54	8.99	17.05	16.64	16.92	12.95

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-18: TENNESSEE AGRICULTURAL OUTPUT
(Millions of Dollars)

# DESCRIPTION	MODEL LABEL	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
		HISTORICAL DATA									
1 CASH RECEIPTS	TCRTOT	659.6	702.5	741.3	831.4	1143.5	1014.6	1116.9	1281.5	1380.6	1625.4
2 PERCENTAGE CHANGE		7.80	6.50	5.52	12.15	37.54	-11.27	10.08	14.74	7.74	17.73
3											
4 CROPS	TCRCRPS	244.1	268.0	319.5	316.0	503.1	555.8	505.8	601.1	705.2	757.1
5 PERCENTAGE CHANGE		0.98	9.79	19.22	-1.11	59.21	10.47	-9.00	18.86	17.31	7.35
6											
7 MEAT ANIMALS	TCRMEAT	246.7	261.0	249.9	331.0	412.9	226.6	366.9	405.5	398.3	564.2
8 PERCENTAGE CHANGE		16.62	5.81	-4.26	32.47	24.75	-45.13	61.93	10.51	-1.75	41.64
9											
10 DAIRY PRODUCTS	TCRDAIR	109.3	113.3	115.5	123.0	133.3	156.1	168.8	193.8	203.5	216.3
11 PERCENTAGE CHANGE		2.79	3.68	1.89	6.54	8.38	17.09	8.13	14.81	5.01	6.29
12											
13 POULTRY AND EGGS	TCRPEGG	59.5	60.2	56.4	61.4	94.1	76.2	75.4	81.1	89.8	87.2
14 PERCENTAGE CHANGE		13.80	1.09	-6.24	8.72	53.39	-19.09	-1.00	7.52	10.73	-2.85
15											
16 EXPENSES	TFRMEXP	251.6	270.6	269.9	294.5	416.4	371.8	488.1	506.7	632.0	702.4
17 PERCENTAGE CHANGE		3.54	7.55	-0.27	9.10	41.40	-10.71	31.28	3.81	24.73	11.14
18											
19 GROSS OUTPUT	TGPFRM	408.0	431.9	471.4	536.9	727.1	642.8	628.8	774.8	748.6	923.0
20 PERCENTAGE CHANGE		10.60	5.86	9.15	13.89	35.43	-11.59	-2.18	23.22	-3.38	23.30
21											
22 GROSS OUTPUT (MIL 72 $)	TGPAG*	485.1	518.5	558.9	536.9	469.4	430.8	430.7	531.4	510.3	526.2
23 PERCENTAGE CHANGE		1.13	6.88	7.79	-3.94	-12.57	-8.22	-0.03	23.38	-3.97	3.12

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.

TENNESSEE ECONOMETRIC MODEL

HISTORICAL TABLES AS OF NOVEMBER 15, 1979

TABLE B-19: TENNESSEE EXOGENOUS ASSUMPTIONS

#	DESCRIPTION	MODEL LABEL	HISTORICAL DATA 1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	OTHER INDUSTRIES WAGES & SALARIES	TPYC04	13.7	14.8	16.7	18.6	21.5	24.7	25.9	29.0	31.8	37.6
2	MILITARY WAGES AND SALARIES	TPYC46	140.6	128.7	127.5	141.0	134.4	155.4	156.3	161.7	154.1	166.3
3												
4	INTERGOVERNMENTAL REVENUE TO STATE	TTRVIGR	312.3	373.6	454.1	475.0	554.7	547.6	652.8	784.7	833.7	917.0
5	TAX RATES											
6	ALCOHOLIC SPIRITS	TTRRALC	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
7	SALES & USE	TTRRSU	3.0	3.0	3.0	3.5	3.5	3.5	3.5	3.8	4.5	4.5
8	TOBACCO	TTRRTOB	8.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
9	CORPORATION EXCISE	TTRRCE	5.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
10												
11	TIME	TIME	69.	70.	71.	72.	73.	74.	75.	76.	77.	78.
12	DUMMY MEMPHIS IN TVA SYSTEM	DUMMEP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13	DUMMY PROPERTY ASSESSMENT CHANGE	TNQ3AS	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
14	WEIGHTED PROPERTY TAX RATE	TLPTAXWTRT	2.71	2.37	2.13	1.92	2.48	2.51	2.56	2.80	2.90	2.93
15	DUMMY FOOD STAMP	DUMFS	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.
16												
17	INTERGOVERNMENTAL REV FED TO LOCAL	TLGGRIRGFED	43.5	58.3	95.6	97.2	184.9	207.0	201.9	245.9	281.0	321.8
18												
19	CATTLE AND CALVES MARKETINGS	TCMKT	681.0	704.4	663.2	757.1	706.9	475.6	1068.8	929.7	940.2	922.3
20	CHICKENS AND BROILER PRODUCTION	TCHRBRL	182.6	176.2	192.9	216.4	188.5	164.1	125.6	153.1	196.0	180.2

SOURCE: TENNESSEE ECONOMETRIC MODEL, CENTER FOR BUSINESS AND ECONOMIC RESEARCH, UT-KNOXVILLE.